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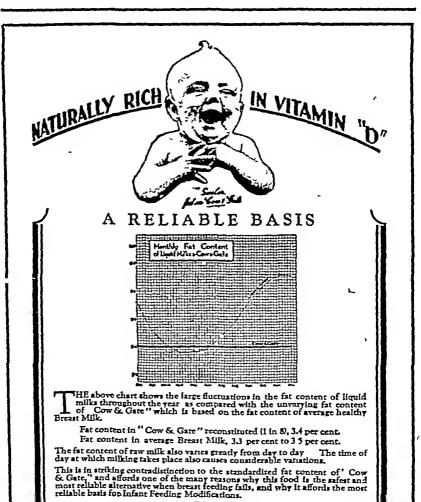
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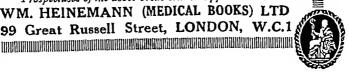
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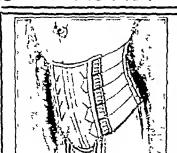
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way into the urinary tract.

We had proved in earlier work that atrophy of the whole of the muscular and muco coat of the digestive tract took place when animals were fed on food deficient in vitamin 1 Following upon this atrophy and intestinal stasis we thought it might be possible to tra infection via the intestinal canal, so we fed certain organisms to animals whose diet w deficient in vitamin B and also to a number of control animals

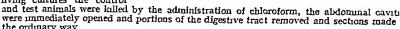
The test animals were fed on a completely deficient vitamin-B diet for a month and the on a partially deficient diet for a further eight weeks. To these partially deficient anima and to the Bemax fed ani

mals were given living cultures of various organisms, pneumococci to some, staphylococci to others, and to the remaining animals strepto-cocci grown from a tooth removed from a patient suffering from rheumatoid arthntis Pure cultures were made of each of these organisms in broth

The animals were given no liquid for twelve hours, and were then given the broth containing living cultures mixed with milk, which they drank readily. The cultures were made up to ten thou sand million organisms to the cc of broth, one cc. of this culture was given in one meal with fresh milk.

The control animals were fed on the same diet as the test animals except that Bemax was included. Living cultures were similarly given to these controls

Four days after taking the living cultures the control



the ordinary way

In all the vitamin B deficiency (non-Bemax) animals we traced the organisms having per trated through the mucous wall, whereas in the "Bemax-fed" animals we found that organisms had penetrated the mucous membrane and only very few were found in the lum of the intestine, whereas in the "non-Bemax" animals (vitamin-B deficient) the whole the intestinal tract was loaded with organisms

The illustration is a reproduction of a section from the vitamin-B deficient (non-Beme animal and shows streptococci within the lacteal. They have penetrated through t mucous surface and are lying in the lymph channel.

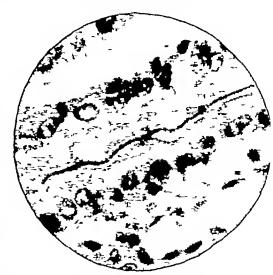
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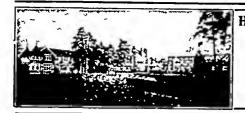
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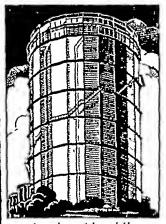
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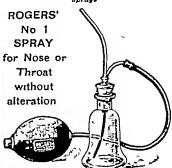
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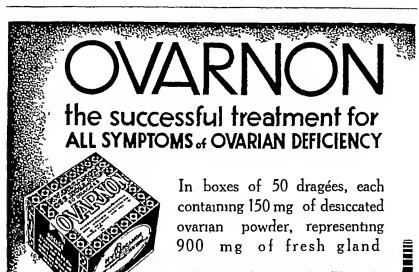
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That Ovarian Residue extract can also be successfully employed for the induction of labour, either at full term, or earlier (at the eighth month) should the necessity arise, and that with this form of induction, in both primiparæ and multiparæ the labour produced is almost painless throughout the first and beginning of the second stage

The above findings have been substantially confirmed by practitioners who have employed "Opojex" Ovarian Residue (B O C)

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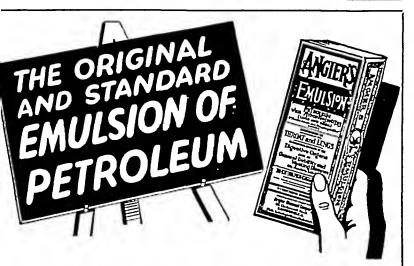
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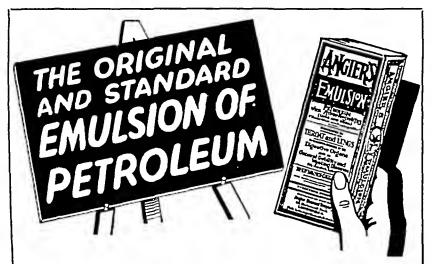
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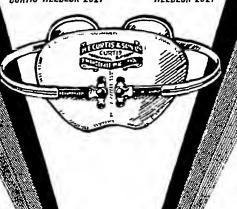
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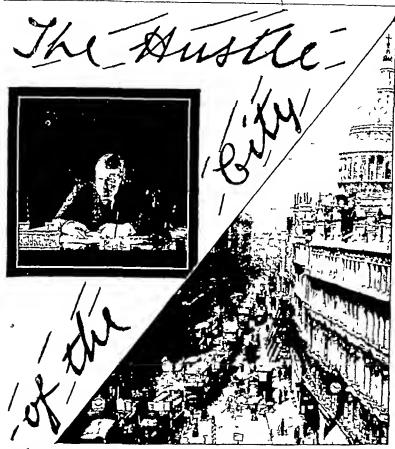


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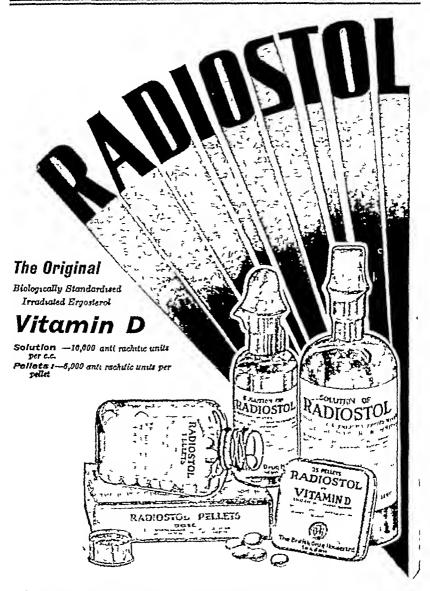
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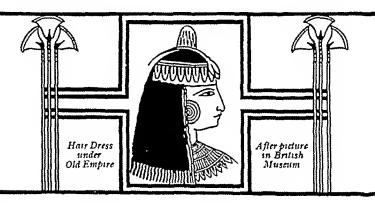
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NOVEMBER

1930

The Future of the Professions.

By MORRIS FISHBEIN, M D

Editor of the Journal of the American Medical Association

OR many centuries the professions of doctor, of teacher, of pharmacist and of lawyer have been practised among men In an earlier day, a student of law read with a lawyer, the medical student worked with a practising doctor His technical education was limited to the field with which he was To-day the training in these primarily concerned professions is as broad as knowledge itself The lawyer must be grounded in philosophy, psychology, sociology and economics, as well as in English composition and in the ability to express himself understandingly to all mankind There has come to be some distrust of legal ritual and more and more emphasis placed on the law as a humanitarian occupation The medicine of to-day is based on all of the fundamental sciences, including chemistry, physics, biology, physiology, anatomy, bacteriology The medical student must be familiar not only with his own language, but with foreign languages, for medicine is most international of human He must have learned to express himself understandingly not only in medicine, but in all of the The teacher who formerly knew no technique sciences

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but the possibility of inserting knowledge forcibly into the young by repetition and training of memory is now far more concerned with the aptitudes and special abilities of those who come before him. Hence, the training of to-day in all the professions takes note of modern pedagogics, of the broadness of human interests, of all of the relationships of mankind, and endeavours to produce a far higher type of man and woman in the profession than was ever previously the case

In the schools of pharmacy in the United States young men are still being trained as members of a great profession. The pharmacist has always been the first assistant of the doctor. He it was who aided the development of drugs and who encouraged efficient treatment of disease. He has been well grounded in the fundamental sciences of chemistry, physics, botany, and he had almost from the first a series of ethical principles which maintained him in proper courses of life and practice. But pharmacy, alas, is not the profession that it was, and it is particularly likely to suffer more in the future from the onslaughts of commercialization and mechanization than all of the other professions with which I am here concerned

From the earliest times the professions have constituted a group viewed by the community with respect for the knowledge they possess, admired by the community for the service that they render, appreciated by the community for the good that they do Their emoluments have been tangible and, in many instances, somewhat beyond that of the average worker Far beyond these tangible emoluments they have had the recognition of their fellow-men, which is in itself a priceless reward. No doubt, this very possibility of opportunity for service and good, this very appeal of public recognition, have been the stimulating factors which caused men and women to carry on their educa-

tion beyond the high school and the junior college into the field of vocational training

Wherever medical men meet to-day to discuss the problems current in scientific medicine and in its practice, no question concerns them as much as the attempt to socialize, organize, mechanize or otherwise modify the nature of medical practice Everyone knows that America's greatest contribution to modern civilization has been organization of work and of life and the introduction of machines The leading business men, executives, philanthropists and organizers have observed the fact that medicine, above all other professions, has withstood this aspect of American existence Europeans view the situation with askance and argue that in the development of our American civilization the arts have been lost and that æsthetics have not thrived It has been argued, on the one hand, that the machine has conquered happiness, and, on the other hand, that the machine has aided happiness, since by its use and adoption we save energy and permit a greater amount of lessure

Perhaps the greatest attack yet made on mechanization from the humanitarian point of view is that made by Dean Inge, who prays that Europeans may never succumb to the conditions that exist in America Inge argues that this country has endeavoured to make the prediction of Aristotle come true The great philosopher said that if the spindles of shuttles could move themselves we should have no more need of slaves Mass production is, perhaps, removing the need of the underpaid and unskilled worker, and standardization of production is removing the need for the artist as artisan However, standardization of production cannot be achieved until public opinion is educated to be satisfied with a uniform and, therefore, a naturally low standard American people are absurdly like each other in their tastes Thus, the

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Dean says -

With all my admiration for American industrialism, I cannot wish that the gospel of Henry Ford should spread over the world It is killing the old type of skilled artisan, who took pride in making a beautiful article with his own hands. The machine-minder is not a skilled workman, in spite of his eight or ten dollars a day, it was proved in the war that shopgirls and domestic servants could learn these jobs in a few weeks " Production is increased " Granted, but the old-fashioned handy man and the artist in wood or leather have been turned into mere cogs in a machine "Things are in the saddle and rule mankind "Minding a machine—performing the same mechanical strokes several thousand times a dayis not work for a civilized man

His nervous system and his soul are not adapted to such a life

It is said, no doubt, that his work only lasts for seven hours a day, and that the rest of his time is at his disposal But, alas, his leisure is mechanized and standardized as much as his labour. Is it possible that his personality, so crippled in production, can recover itself in consumption? What he can consume is just the tasteless and soulless product of the machines by which he lives All the arts of advertising, perfected by experimental psychology, are devoted to make him want, and buy, just what everybody else is buying Originality and independence are actually discouraged and condemned as almost immoral eccentricity Mass production gives us only standardized men

At the risk of offending some of my readers, I must insist that no nation can rank as really civilized where high honour is not paid to the artistic craftsman who is willing to spend weeks in turning out an original piece of work into which he has put all his thought, taste and manual dextenty, to the poet and painter who, out of pure love of the beautiful, spend infinite pains in choosing the most perfect expression, in words or on canvas, for their ideas, for the thinker who voyages through strange seas of thought alone, and for the scholar or savant who counts the world well lost knowledge Such persons have always, in Europe, been counted the fine flower of civilization, and their lives are reflected in the infinitely varied beauties of the old towns of France,

Germany, Italy and England

Let us view the professions of medicine, education, pharmacy and law as they exist to-day, and with a view to the possible developments for the future. To-day the banks and the lawyer corporations are breaking down the individual practice of law. In lawyer corporations business men sell the service of lawyers for the drawing of wills and legal papers and for the management of estates. Banks, through salaried employees, attend to most of the work which formerly was the material on which the individual lawyer cut

his legal eye teeth In the State of Illinois and again in the State of New York high judicial bodies have ruled that corporations cannot practise law, since it would put the salaried lawyer in the position of serving his master rather than their client, and that under such corporation practice there is no protection for the Unquestionably, the same arguments apply with equal force to engineering, accounting, medicine or pharmacy by corporations Already banks offer legal services, including the making of contracts, administration of estates, collections and adjustments Already these corporations engaged in the practice of law solicit business because it is the business of law and not the profession of law that they practise Such solicitation would be considered highly unethical if attempted by the individual lawyer It is Mr Mitchell Dawson's conviction that the lawyers themselves have created corporations, and that now they are worrying because the very corporations which they created are about to destroy them Hence he writes of them under the term Frankenstein, Inc Mr Dawson is convinced that if the lawyer is to survive he must relinquish those acts and services which can easily be standardized feels the business man of the future will buy most of his assistance from the big legal shops at a fixed price per actual service Already many corporations in America employ hundreds of lawyers at full time to carry out the great majority of minor legal tasks Only when some tremendous legal problem arises which demands appearance before the leading tribunals of our country will individual lawyers of note, whose very names carry with them power and prestige, be called in to discuss the case These leading lights are in turn served by the full-time minions, much in the same capacity that messengers, file clerks, secretaries and other assistants serve in the business world

Medicine is to-day the subject of a hundred or more

experiments in the nature of medical practice. Great mechanized clinics established for treating certain diseases see not the patient himself, but the diseased organ or the diseased system. Innumerable technicians lend their services to the care of this patient without being disturbed at all as to the identity of the patient and without the patient having the slightest concern as to the identity of his medical attendant. This type of service is called a clinic

In other institutions devoted to group practice a dozen specialists confer their services on a single patient, each of them interested again only in a particular organ and not in the body as a whole Here is an attempt to bring into medical practice the type of organization that has evolved mass production in In other instances a full-time salaried employee who is called a doctor guarantees for a fixed sum to care for all of the complaints of all of the individuals in the industry Here, again, there is no opportunity for him to reject a case for which he is not competent, nor can he take for one patient the extraordinary amount of time that may be necessary because of an unusual condition Here the individualization associated with the work of an artist rather than a technician disappears

More and more through the establishment of great bureaux and systems of control our educational curriculums are standardized in hours devoted to teaching of various subjects set forth in textbooks controlled by propaganda and political organization. The standardization of teaching fixes the opinion of the masses, disregards special aptitudes and abilities, and tends to turn out a standardized product who is more of a robot than a human being

The saddest spectacle of all is the manner in which the pharmacist has succumbed to the inroads of commerce in his profession We have seen that in the past the pharmacist was a scientist To-day the coming of the chain drug-store, the packaged proprietary remedy, the million-dollar advertising appropriations, the inroad of the lunch counter, the toilet goods and the cosmetics have made the pharmacist a sort of supersalesman who moves at the behest of a manipulator of a great drug corporation in Wall Street. A vast number of chain drug-stores endeavour to dispense entirely with the filling of prescriptions and rely on the promotion of packaged goods with exaggerated claims for the majority of their drug business. They encourage substitution, and their name is to-day anathema to both the professions of pharmacy and medicine

It is interesting to contemplate the reasons why medicine, above all other sciences, has been able to resist to a considerable extent the onslaught of organization and mechanization. True, it has been shown that great clinical centres provide efficient service for the treatment of some diseases at a cost lower than the cost of individualized service, but already the public realizes that there is a vast difference between the best medical care and that provided in such institutions. Medicine has resisted the advance of mechanization, not through any great leadership in the field of medicine, but because of the nature of man himself and of the nature of the profession that lives by the study of man and by the relief of man in times of disease and of death

Actually the factors that have made medicine resistant to mechanization and standardization apply in the case of the law, of pharmacy, of education, of the ministry and of every other profession dealing with the bodies and souls of human beings. It is already known that any physical defect exercises an effect on the nervous system. It is already known that every organ and tissue of the human body is intimately related to every other organ. It has been known since the begin-

ning of thought that the human being consists of both a body and mind, and that an attempt to control one without a knowledge of the other is futile. As long as human beings are human, it will be necessary to take into account their mentalities and the reactions of their souls to the conditions of life. In his essay entitled, "Pygmalion or the Doctor of the Future," R M Wilson points out that it is impossible for the physician to continue to speak of the body as though it may be spoken of apart from the mind, and he feels that standardization of humanity is an utter impossibility biologically and psychologically

Unquestionably, exactly as medicine has reacted against the attempt to eliminate the human spirit from consideration, so also must law and pharmacy and, particularly education, react against super-standardization, over-organization and complete mechanization of their professions For some two thousand years the world has been concerned with the warfare between science and religion In this warfare it has seemed for at least the last century that science was certain to conquer, and that all of the spiritual aspects of life were doomed to disappear through the coming of machines Mass production, mass education, mass consumption of time, mass action in the production and consumption of leisure have seemed to tend toward a uniform product, but, inevitably, there has been a reaction based on the fact that science has yet to answer the riddle of life and of death. Out of the failure to answer this riddle has come the new doctrine of humanism

In the seventy-five years in which all of the sciences have advanced more than in the previous thousands of centuries, men have been able to lose their fear of disease and of death, to concentrate on the search for happiness. The machines have provided relief from continuous muscular exercise. The man who toils eight

hours behind the plough or with the pick or with the spade is little inclined to poetry, song, philosophy or history in his leisure moments. With the coming, however, of more time to be devoted to the cultivation of the mind, of æsthetics, of letters and of the arts, these things have not been provided in our civilization. Instead, the attempt has been made to satisfy a standardized public with standardized amusements.

Modern science is making possible happiness for the human being through its understanding of the body's needs. It realizes that human beings differ one from the other and must be treated as individuals if both physical and mental health are to be maintained. Modern psychology and modern philosophy must concern themselves with the idea that no two minds are alike, and that the attempt to standardize the mind, to standardize thinking, to standardize appreciation of music and art and letters will mean the extinction of sesthetics in human life.

There are some who believe that human happiness consists in the ability to avoid thought. Certainly the moron is not happy, since he knows not the meaning of pleasure, nor has he the mentality to appreciate what have been called the higher things of life. Those who study the history of mankind and particularly of the humanities know that the greatest happiness in life comes from a recognition of the qualities that he in these humanities and an appreciation of their virtues

American medicine, through its organization, has taken a definite stand against mass production and mass distribution of medical services. It proposes, from its study of the individual, a physician for the future who will continue to offer his services to human beings as such and not to human machines. The law and education must increasingly devote their organizations to a defence of the same principle

America's great contribution to civilization has been

the provision of leisure by organization of production The system must not be permitted to of materials invade the spiritual, the holy, the æsthetic side of life In these fields mass action means degeneration, and the inevitable result will be the stagnation of the pro-We need not fear that fessions that are concerned the time will ever come when the professions will have yielded completely to the onslaught of the unthinking organizer Such a system is against nature itself For several hundreds of thousands, if not millions, of years nature has been carrying on consistently, conducting its experiments with life The efforts of man to change the trend of nature have been pitifully futile Let him set up any system that is antibiological and he will find that nature will in the future, as it has in the past, reach forth the hand that smites and produces death Let him study nature and adapt his ways to the ways of life, and he will find increasing happiness for both his body and his soul

The Examination of the Heart and Blood Vessels from the Point of View of Life Insurance.

By THEODORE THOMPSON, MA, BSc, MD, FRCP, FRCS

Physician to the London Hospital, Specialist Medical Referec to the Home Office, Chief Medical Officer to the Royal Exchange, Pearl, Friends Provident and London Assurance Companies, and Chief Medical Officer in London to the Royal Insurance Company

THE examination of the heart and blood vessels is of greatest importance in cases of life insurance Early claims frequently occur owing to the failure of the examiner to appraise correctly the state of these organs When it is recognized that in the United Kingdom deaths from heart disease outnumber those from any other cause, and in the United States of America the mortality from cardio-vascular disease is more than the combined total from tuberculosis and cancer, it is clear that the life insurance examiner must pay particular attention to the state of the heart and vessels In the selection of lives for life insurance, four principal points of view must be considered (a) The personal history, (b) the family history, (c) the environment, and (d) the present condition of the proposer

Personal History — The diseases which leave their mark upon the cardio-vascular system may be grouped in the following order of their relative importance (1) Acute rheumatic fever, with this is associated a history of chorea or a history of acute rheumatism

- following scarlet fever (2) A history of syphilis (3) A history of acute gout (4) A history of other specific fevers, such as diphtheria and influenza
- (1) Rheumatic fever is, of course, the commonest cause of valvular disease of the heart If a life has had an attack of acute rheumatism sufficiently severe to keep him in bed for a month or six weeks, the chances are that his heart muscle or valves have been more or less affected, though recovery may have taken place Such an illness was formerly thought to require the addition of five to seven years, but the usual practice of the companies is now to pass a life of 25 years or over at first-class rates even when there is a history of one or more attacks of acute rheumatism, provided the examiner considers that the heart is not affected at the time of the examination This conclusion has been considered, because lives who have had rheumatic fever in childhood are much less liable to further attacks after the age of twenty-five, and when rheumatic fever does occur after this age, it is far less likely to attack the heart than in childhood A history of rheumatic fever, of course, impels the examiner to an exceptionally strict examination of the heart, which should be undertaken both in the prone and upright positions, as de Haviland Hill pointed out, the murmur of mitral stenosis is sometimes only heard when the individual is in the recumbent position
- (2) Syphilis —In the past a history of syphilis has been too lightly treated by insurance companies in this country—Recent work by the Association of Life Offices in America has shown that the mortality in lives who have a history of syphilis is very much greater than was formerly suspected, and some of its most important consequences—fall on the cardio-vascular system Syphilis affects the heart chiefly by the mesaortitis which it produces—This tends to narrow the orifices of the coronary arteries, and is an important cause of

HEART AND BLOOD VESSELS

coronary thrombosis and cardiac infarction. Disease of the smaller branches of the coronary arteries is also the result of syphilis, and may lead to myocardial fibrosis and even gummata in the cardiac muscle Saccular aneurysm of the aorta is also the result of syphilis, and is not an unimportant cause of early claims in life insurance. Acute syphilis of the brain and spinal cord is also due to endarteritis, and has, if anything, been more frequent since the introduction of the arsenical treatment of the disease, and forms an important group of early claims in lives who have suffered from syphilis. When there is a history of syphilis, strict investigations should be made as to the symptoms of cardiac disease, such as faintness, giddiness or shortness of breath

In a recent case in which a proposer insured for a large amount, he was examined by a well-known consultant, who found nothing whatever the matter with him, except a history of syphilis in his youth. The question as to whether he had had any attacks of faintness was answered in the negative. About a month after he had been accepted as a first-class life, he suddenly fell down dead from acute heart failure. A relative somewhat naïvely remarked at the inquest that it was a rather remarkable thing that the deceased had recently been accepted for life insurance, as for several months past he had had attacks of giddiness and faintness

This case shows how important it is to emphasize the questions as to cardiac discomfort or distress in any proposer who gives a history of syphilis

- (3) Gout —This is much less common in this country than it formerly was, probably owing to the fact that over-eating and over-drinking are not so common. An applicant with a history of one or more attacks of definite acute gout is, however, not a first-class life, and requires a small extra. In such cases the state of the urine, blood pressure and arteries must be carefully scrutinized.
- (4) Specific Fevers—The history of influenza and diphtheria, especially if they have occurred within twelve months previous to the examination, should lead

to careful examination of the heart for possible after-effects

A personal history of symptoms of cardiac disease must be carefully inquired into Attacks of fainting in a young proposer may often be nervous in origin, brought about by fright or excessive stuffiness in a room, while some cases of repeated attacks in young people are due to minor epilepsy A history of attacks of fainting in a man of over forty, however, must be much more seriously regarded, especially if no definite cause for their occurrence can be given It would be wiser to postpone such a case for at least twelve months Shortness of breath on exertion is now generally inquired into on most insurance forms If associated with any physical signs of cardiac disease, it should certainly lead to rejection, but it must be remembered that many middle-aged lives of sedentary occupation are somewhat out of breath on severe exertion owing to lack of exercise, and in the absence of other signs of cardiac disease, this is not of great importance personal history of pain in the chest is most important, especially when it is brought on by exertion proposer admits that after walking for a short distance he is obliged to stop and rest, the case should always be declined, even in the absence of any marked enlargement or other physical signs of heart trouble History of pain in the chest should also lead to careful examination for aneurysm Palpitation is another cardiac symptom frequently present in the history, but it is certainly much less important than the other symptoms previously described, and may be neglected in the absence of gross physical signs of disease in the heart itself

Family History —This is undoubtedly of importance Of recent years it has been a custom of insurance companies to lay much more stress on the personal con-

HEART AND BLOOD VESSELS

dition of the proposer and to neglect to a large extent the indications that are given by the family history There is no doubt that the tendency to cardiac degeneration and arterial disease is hereditary, and in those cases where the parents, and possibly the brothers and sisters, have died under the age of fifty-five, with a history of heart failure, angina pectoris, apoplexy, or Bright's disease, the life should certainly be rated up five years, even if his present condition is satisfactory Great importance was placed by Sir Hermann Weber upon the group of lives whose family histories show an early breaking-down age, and if in addition to such a family history the proposer shows signs of slightly increased blood pressure and arterial thickening, the case must be seriously regarded, and should not be taken for a whole life, the risk being limited to an endowment assurance

Environment — The environment of a life is important as to his social position, occupation, habits and manner of life, and place of residence In lives with slightly impaired hearts, the social position is of much importance, as the heart is less likely to deteriorate if the proposer is not hampered by monetary considerations, whereas if he has to make a living under adverse his expectation of life circumstances. diminished A strenuous occupation involving manual labour would bar a case showing slight cardiac impair-Financiers, Stock Exchange men and speculators are all liable to great mental strain, and a slight hypertension in such an occupation would be more seriously regarded than in a farmer or a clergyman, and classes of occupation where the ascertained mortality is low. If any doubt is present as to the habits as regards alcohol in a life suspected of slight cardiac weakness, the case should be declined or postponed

The influence of over-smoking on the heart and

vessels is undoubted Excessive indulgence in tobacco leads to tachycardia, irregularity and cardiac dilatation, and must be considered in assessing a life with any sign of circulatory weakness The influence of tobacco upon blood pressure is uncertain, Mitchell Bruce thought that excessive smoking was one cause of hypertension, but other authorities consider that excessive smoking has a tendency to produce a low pressure Excessive athletic exercises may undoubtedly cause hypertrophy, and eventually dilatation of the heart It is probable that the slight hypertrophy often seen in amateur athletes is not of itself likely to shorten the expectation of life, but if there are any symptoms of impaired cardiac efficiency or if the enlargement is considerable, the case should be postponed or rejected With regard to residence, if the proposer has to live at a high altitude, such as obtains in Peru or in certain parts of India, the risk is considerably increased if any disability is already present, and if the life has to live in the tropics, it is doubtful if he should be accepted at all

Present Condition—The general appearance of the life is of considerable importance in cases of cardio-vascular debility—Overweight, undoubtedly, adds to the risk if there is any cardiac impairment—Carruthers has shown that heart disease is more than twice as common a cause of death in overweight lives than in lives of normal weight—In cases of hypertension, the flushed face, thick neck and heavy build must be noted. The brick-red flushed cheeks and slightly blue lips of a typical mitral stenosis case will be evident, but I have examined for life assurance a case of congenital morbus cordis in a man of 30, with considerable cyanosis and clubbing of the fingers, he was accepted for a short endowment with a considerable extra—An extreme degree of nervousness in the proposer often

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gives rise to much trouble to the life insurance examiners. A nervous youth may have a heart beating violently, at the rate of 100 per minute. The rhythm may be markedly irregular, and a systolic bruit may be heard over the left border of the heart, which is of cardio-respiratory origin and usually disappears when the life takes a deep inspiration and holds his breath

The size of the heart is next examined by inspection, palpation and percussion, with the position of the apex beat carefully noted In stout lives with a thick chest wall this may be somewhat difficult, but even when the apex beat cannot be felt, its position can usually be determined by percussion In marked emphysema of the lungs, it may be difficult to make out the apex beat, and here percussion might lead one to the conclusion that the heart was smaller than was really the case Cases of slight enlargement of the heart, in which the apex beat is in the mid-clavicular line, and the hypertrophy appears to be due to heavy manual labour or to excessive athletic pursuits, are generally accepted at ordinary rates, if there are not any symptoms or physical signs of any cardiac weakness, but where enlargement of the heart occurs with other signs of cardiac impairment, an extra has to be imposed or the case declined If the apex beat is outside the midclavicular line, that is to say, more than half an inch away from its normal situation, the case should not be considered

Much information may be obtained by careful testing of the heart sounds The first sound at the apex may be short and approximate in character to that of the second sound This is often an indication of myocardial weakness, and is frequently found in cases of fatty heart. If such a proposer was more than 20 per cent over the normal weight and gave any history of shortness of breath on moderate exertion, he could not be accepted. In cases of cardiac hypertrophy asso-

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ciated with hypertension, the first sound may be dull and booming, and is then often accompanied by an increase in the second aortic sound If these physical signs are accompanied by a systolic blood pressure over 170, it would not be possible to take the life on any In cases of mitral stenosis, the first sound at the apex is often short and sharp in character, and is accompanied by a presystolic murmur cases, the pulmonary second sound is usually increased Cases of well-marked mitral stenosis are uninsurable, because not only is there the risk of heart failure, but also of attacks of severe hæmoptysis and of cerebral embolism from pieces of ante-mortem clot in the left auricle A very common mistake, however, among inexperienced examiners for life insurance is to report a forcibly acting heart with a loud rumbling first sound in a nervous proposer as one affected by mitral stenosis If the life is examined after his agitation has somewhat subsided, the first sound becomes normal again

Cardiac murmurs —Formerly a well-marked cardiac murmur would have been sufficient to reject a life proposing for insurance, but of late years the effect of cardiac murmurs in reducing the expectation of life has been greatly doubted. It has been pointed out that the really important question is the state of the heart muscle. A cardiac murmur is important only in so far as it is likely to lead to or be followed by degeneration of the heart muscle. It is necessary, moreover, to differentiate between the various murmurs that are heard in the heart, and by careful examination to assess their significance. Systolic murmurs at the apex of the heart do not always mean disease of the mitral valve.

The cardio-respiratory murmur has already been described. It occurs in nervous, agitated people with forcibly beating hearts. It is heard over the left border of the heart, and is not transmitted in the left axilla

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It disappears when the life takes a full inspiration and holds his breath, and again reappears during expiration. It is generally diminished when the life lies down. There is no enlargement of the heart and the apex beat is in the normal position. Such a murmur has no effect in reducing the expectation of life.

Hæmic murmurs may be heard at the apex, but they are usually louder in the pulmonary area. They are usually increased when the patient lies down, and are accompanied more or less by pallor of the lips and mucous membranes. As a rule, there is no enlargement of the heart, and the murmurs are not transmitted to the axilla. Such murmurs are only significant of the anæmia that produces them, and of themselves do not affect the expectation of life.

Mitral regurgitant murmurs — These murmurs are maximum at the apex, and are conducted towards the axilla and are often heard behind the angle of the left scapula They are usually accompanied by enlargement of the heart, the apex beat being either inside or outside the mid-clavicular line, and the right side is also enlarged The pulmonary second is usually increased There is no doubt that many lives with these physical signs live to an old age and die of some disease other than heart disease On the other hand, such lives do not do well if attacked with pneumonia, and it is, therefore, necessary to rate them up In the case of mitral regurgitant murmur in a life aged 25, with only slight enlargement of the heart, showing no signs of cardiac debility, an extra of 7 to 10 years should be added, and an endowment insurance maturing at not later than sixty should be insisted upon

Mitral diastolic murmurs —Lives who exhibit well-marked presystolic murmurs, with or without a palpable thrill or diastolic murmur of mitral origin, cannot be accepted, except upon terms which approxi-

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mate to a pure endowment policy

Systolic murmurs at the aortic area —The commonest cause of an aortic systolic murmur is a roughening of the aortic valve due to atheroma It is usually accompanied by a well-marked aortic second sound, and there may be no hypertrophy of the heart Such a condition of itself might not lead to any diminution in the expectation of life, but when such a murmur exists, it is often accompanied by atheroma elsewhere, and in situations where life may be suddenly terminated It may be associated with, for instance, atheroma of the coronary arteries, which is the commonest cause of sudden death, and there may also be atheroma of the vessels at the base of the brain, with consequent cerebral thrombosis or hemorrhage A rarer cause of aortic systolic murmur is syphilitic mesaortitis, and if a life with an aortic systolic murmur gives a history of syphilis, the life had better be declined The rarest cause of aortic systolic murmur is aortic stenosis, where the valves have become hardened and glued together by old rheumatic trouble or calcification In these cases the murmur is accompanied by hypertrophy of the left ventricle and by the characteristic flat-topped long-sustained pulse aortic second sound is absent, and there is often a palp-These cases should either be able systolic thrill declined or loaded up heavily if accepted at all

A ortic diastolic murmurs may be the result either of antecedent rheumatism or of degenerative changes of the aortic valve. They are accompanied by dilatation and hypertrophy of the left ventricle, a collapsing pulse, a diminished or absent aortic second sound and a great increase in the pulse pressure. If an aortic diastolic pressure is due to degenerative change in the valve, the case must be declined, but certain cases of aortic regurgitation due to acute rheumatism, where the condition has remained stationary for some years

and has been accompanied by very slight enlargement of the heart, may be accepted for a short endowment with a heavy extra

Occasionally a systolic murmur may be heard in the chest away from the regular cardiac area, and this may lead to suspicions of an aneurysm. Aneurysms are not uncommonly overlooked by life insurance examiners, as there may be no external signs of their presence, and the physical signs are often too ill-defined to enable a diagnosis to be made, but only gross carelessness and the failure to bare the applicant's chest could be responsible for recommending him for insurance with a pulsating aneurysmal tumour. At life insurance examinations, both radial pulses should be felt. If they are unequal, aneurysm should be suspected

The examination of the pulse—In healthy adults, when sitting, a pulse should be between sixty-five and eighty-five, and a change of position to the recumbent posture should not lower it by more than ten beats per minute. Nervousness at the life insurance examination often causes an increased rapidity of the pulse to 100 per minute or more, but when the life's confidence is obtained and the pulse taken after a few minutes' interval, it usually becomes more or less normal

Rapid pulse is not a favourable sign from an insurance point of view, and is found in most cases of heart disease, with exophthalmic goitre, neurasthenia and in a subject who indulges excessively in alcohol and tobacco. If the pulse is extremely rapid, over 180 a minute, it may be one of the rare cases of paroxysmal tachycaidia, which will certainly require a considerable extra. Slow pulse or bradycardia, that is a pulse below 55, may indicate heart block, brain lesions or liver trouble. Occasionally as a rare anomaly, a man in normal health may have a pulse rate as low as 40. Most companies impose an extra if the pulse rate is 50.

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Irregularity of the pulse or arrhythmia —This may be due to (1) Sinus arrhythmia, a condition which occurs in young people, where the pulse varies with expiration and inspiration It disappears on holding the breath, and does not diminish the expectation of life No extra is required (2) Irregularity of the pulse may be due to extra or premature systoles These may be due to nervousness, to excessive indulgence in tobacco, and may be a first sign of myocardial trouble They are comparatively frequently heard in people over forty If unaccompanied by any sign of cardiac debility, such as shortness of breath or pain in the chest, and if the heart is of normal size and the sounds good, they may be neglected for the purposes of life insurance (3) Auricular fibrillation —Here the pulse is completely irregular in its irregularity, and the condition may occur in cases of mitral stenosis and also in myocardial degeneration This is a serious form of arrhythmia, and such cases are better declined (4) In the same way, cases of heart block, whether incomplete, when every third or fourth beat is dropped, or complete, when the ventricle is beating slowly at its own rate of between twenty and thirty-five per minute, are best declined, as they indicate grave changes in the heart muscles (5) Another irregularity, the *pulsus alternans*, where the beats occur at regular intervals, but are alternately large and small, would lead to total rejection of the proposer, as such a pulse is usually found in cases of severe exhaustion of the cardiac muscle

The state of the arterial wall—It is probable that in perfectly healthy lives the radial artery cannot be palpated at any age, and I have examined several proposers between 65 and 75 for life insurance, in whom no thickening of the radial artery could be detected. This does not, however, mean that a slight thickening

of the radial artery in a man of 60 is a bar to life assurance

- (1) The radial artery may be uniformly thickened and straight, and feel like a piece of whipcord. This condition is due to increase in the muscular layers of the artery, and is usually associated with increased arterial tension, hypertrophy of the left ventricle and increase in the second aortic sound. In many cases, evidence of kidney disease, such as persistent traces of albumen and the presence of casts in the urine, are associated with this variety of arterial thickening. This myohypertrophy calls for a considerable extra and limitation of the length of the insurance risk. If accompanied by evidence of renal disease, the case is uninsurable.
- (2) The radial artery may be irregularly thickened and tortuous. This is the result of atheroma, a degenerative process. The temporal arteries are often visible as tortuous thickened cords. Atheroma has a patchy distribution in the arterial system, and while its presence in the radial artery is not of itself serious, the possibility of further patches of the disease in the cerebral arteries, or, more serious still, in the coronary arteries, must be remembered. If most careful examination has failed to reveal any evidence of cardiac or cerebral disease, a tortuous and irregular radial artery still requires an extra of from five to seven years.
- (3) The radial artery may be calcified, the lime salts being deposited circularly in the middle coat (Monckeberg's degeneration). This somewhat rare condition in the radial artery is usually more marked in the arteries of the lower limbs, and is associated with diabetes and gangrene of the lower extremities. If present in the radial artery, it will be considerable in the arteries of the legs, and the case should be rejected
- (4) In uncomplicated cases of syphilitic arterial disease, the radial arteries are usually normal, and

evidence of this form of vascular trouble must be looked for at the aortic area and in the brain

Arterial pressure —The measurement of the blood pressure has been of the greatest value in life insurance examination Two measurements have been made (1) The systolic pressure, the force necessary so to compress the artery that no further pulsation can be detected below the point of compression diastolic pressure, which is the dynamic force of the constant flow of the body's blood current, and coincides with the point where the arterial tube just ceases to be flattened by the external pressure of the cuff between the pulse beats The relative value of these two measurements in life assurance will be discussed later

The systolic pressure may be examined by the palpatory method, where the pressure in mm of Hg is that just sufficient to obliterate the radial pulse may also be measured by the auscultatory method, where the sounds heard in the brachial artery below the point of compression are heard with the stethoscope The artery is fully compressed, so that no sound can be heard by the stethoscope below the point of compression The pressure is gradually released, and four sound phases are described -

(1) The first phase of sharp tapping sounds first clear definite tap or click indicates the systolic pressure, and in a healthy young adult is 120 mm Hg This phase generally is of 10 mm Hg in length

(2) Second phase The mitral sounds are accompanied by a soft blowing murmur The phase begins

at 110 mm Hg and lasts to 100 mm Hg
(3) Third phase The murmur disappears, and a series of loud, clear sounds occur, and last from about 100 mm Hg to 84 mm Hg

(4) Fourth phase The loud, clear sounds gradually change into weak, muffled or dull sounds The average length of this fourth phase is 6 mm Hg, but it may

in certain cases be as long as 50 mm. Hg. At a pressure of 80 mm. Hg, the dull sounds tail off into silence

There is a serious discrepancy between American and English physicians as to the point to be taken as to the true diastolic pressure. Most physicians in America take as the diastolic pressure the end of the fourth phase, when silence begins, but English physicians, and some Americans (Dr. Fisher, of the New York Mutual Company) regard the beginning of the fourth phase as the true diastolic pressure. The difference between the diastolic pressure and the systolic pressure is called the pulse pressure. Thus, in a man of 30, with a systolic pressure of 120 mm. Hg and a diastolic pressure of 80 mm. Hg, the pulse pressure would be 40 mm. Hg

Systolic arterial pressure -As has already been described, the systolic pressure can be easily determined by the palpatory or auscultatory methods The point usually taken is the mean between the reappearance of the pulse as the compression is relaxed and the point when the pulse just disappears as the compression is slowly increased These two points frequently coincide, and the systolic blood pressure is a clearly defined point, so that if a proposer is examined by two different physicians, at the same time, with the same instrument, their readings do not differ by more than one or two mm Hg In taking the systolic pressure, make sure that the muscles of the arm are fully relaxed, and the life comfortable and at ease If possible, it is better to take it before, rather than after, a meal, and certainly not after strenuous exercise If the initial blood pressure reading is high and the life in other respects is a good one, but seems nervous and excited. take a second reading in five minutes' time, or tell the proposer to return next day for a further test average systolic blood pressure tends to increase with age Thus at 20 years of age it is 120 mm Hg, at 30.

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The blood pressure is also low in cases of jaundice, anæmia and general debility. It is also often low in neurasthenic cases, and where a focus of septic absorption exists in diseased tonsils, teeth or nasal disease. As a rough rule in life assurance, if the systolic blood pressure is not below 100 mm. Hg and the proposer is otherwise normal, the life can be accepted at normal rates.

Diastolic blood pressure—Many insurance companies now ask for the diastolic blood pressure. The age variation in the diastolic blood pressure is between 80 mm. Hg at age 20 and 90 mm. Hg at 60 years of age. In disease, it may rise to 135 mm. Hg

In my opinion, the recording of the diastolic pressure on life insurance forms is superfluous and misleading for the following reasons —

- (1) The exact point where the diastolic pressure is read off varies in different countries. In America, the end of the fourth phases is taken, while in England, the end of the third phase is taken to be the true diastolic pressure. As before explained, this may cause an error of 6 mm. Hg, and often much more
- (2) The exact point where the third phase merges into the fourth phase is often ill-defined, and is nothing like so sharply marked off as the systolic pressure point. This may cause an error of 5 or more mm. Hg
- (3) Many country practitioners find great difficulty in directly determining the diastolic blood pressure
- (4) As Conybeare, in his recent paper to the Medical Assurance Society, has shown from American statistics, the diastolic pressure varies pari passu with the systolic pressure, whether in health or disease, with one important exception. The exception is that in aortic regurgitation there is a very marked lowering of the diastolic pressure, which may even be zero. The occurrence of this form of valvular disease will, however, be sufficiently obvious without the examination of

125 mm Hg, at 40, 130 mm Hg, at 50, 135 mm Hg, and at 60, 140 mm Hg Whether this increase is purely physiological or is due to very early degenerative changes has not been yet definitely settled, but I have frequently examined super-excellent lives of 60 and 65, where the blood pressure was still 120 mm Hg.

The American mortality experience, however, shows that lives with blood pressures over 140 mm. Hg are unfavourable. Thus in 525 cases, where the life had a blood pressure from 10-14 mm above 140 mm. Hg, the ratio of mortality was 136. In 1,685 cases where the blood pressure was 15-24 mm above 140 mm. Hg, the mortality ratio rose to 183, while in 900 cases where the life was taken with a blood pressure between 165 and 170, it had risen to 204.

As a general rule, lives with systolic blood pressure persistently over 170 mm should be declined. Where the blood pressure lies between 150 and 170, a considerable extra of 7 to 9 years should be added, and the insurance risk limited to 10 or 15 years. If, in addition to the increased blood pressure, there should be any further unfavourable features, such as overweight, early breaking down in the family history, symptoms of cardiac weakness or evidences of renal disease, such as albuminuma, the life should be rejected.

Hypotension —Cases of low blood pressure frequently occur in life assurance examination. It may be compatible with perfect health, and even marked mental and bodily vigour. A low blood pressure is, however, found in cases of tuberculosis of the lungs, where the systolic pressure may be 95-100 mm. Hg. The lowest blood pressures of all occur in Addison's disease, which is usually the result of tuberculous disease of the suprarenal glands. Here the blood pressure may be 70-80 mm. Hg, the patient is often pigmented and may be observed to show great bodily weakness and asthenia

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normal after three minutes If instead of rising after exercise the systolic pressure falls, the strength of the heart muscle is probably impaired However, too much value has been attached to this test

The method of Vaquez, in which the pulse rate and pressure is taken with the patient prone and erect, is not so much an index of cardiac efficiency as of vasomotor control. On rising to the erect position, the pulse should increase 12 beats a minute and the systolic pressure 8 to 10 mm. Hg. One of the most marked variations from this I have ever seen was in a young man of 22, who had suddenly grown to a height of 6 ft. 5 ins. In his case his pulse was 64 when prone and rose to 98 per minute when erect. I have watched him for seven years, and his heart has remained quite normal, and the variation in pulse rate when erect and prone has now become normal.

It has recently been suggested that respiratory tests by means of a spirometer, combined with the blood pressure and pulse rate, should be taken, but at present these methods are too complicated and take up too much time for use in any but very special cases. In any case in which the examiner is doubtful about the condition of the heart, the more simple test described above should be made. If the results are bad, the case should be declined or postponed, but each case must be considered on its own merits, and no very hard or fast lines can be laid down

the diastolic pressure

(5) As the maximal variation in the diastolic pressure is 10 mm. Hg in health and 45 mm in disease, and the probable error in its determination may be anything from 5 to 20 mm. Hg, it is clear that from a mathematical point of view, the value of the diastolic reading is very slight

I frequently find such a return from the country as the following "Systolic blood pressure 145 mm Hg, diastolic blood pressure 142 mm Hg" Such reports cause unnecessary trouble and mystification to actuaries and other lay officials of insurance companies, and, for the above reasons, I think that the diastolic pressure reading should be omitted from insurance forms

Test for cardiac efficiency—It is, of course, of the utmost importance to know if the heart muscle is capable of efficiently performing its work. From a life insurance point of view, it is not only necessary for the heart to be efficient at the time of the examination, but the examiner has also to assess the probability that it will be carrying on efficiently in 15 or 30 years' time. None of the tests for cardiac efficiency are very satisfactory. The usual test made is as follows—

The pulse rate and systolic pressure are taken with the proposer at rest. He is then told to bend down and try and touch his toes, repeating the movement 10 to 20 times, according to the direction of the examiner, who will, of course, stop the exercise if any distress is caused, which, if present, must be recorded. The pulse rate and systolic pressure are again taken half a minute after the exercise and again three minutes later. After the exercise, in a normal heart, a pulse rate of 72 may rise to 92 and return to normal after three minutes. If the pulse rate rises to over 110 and does not return to normal in three minutes, the heart muscle is probably weak. In the same way, the systolic pressure should rise after exercise from 15 to 40 mm. Hg and return to

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gained by touch, but whereas the thermometer, used with a minimum of care, gives an accurate reading of the heat to which it has been exposed, there is a certain element of personal skill involved in the use of the sphygmomanometer Omitting the investigation of the diastolic pressure by auscultation, which clearly demands skill and practice, the method of finding the systolic pressure by obliteration of the pulse at the wrist depends on the observer's acusty of touch, and the more experienced the observer and the more delicate his feeling of the last flickering beat, the higher will be the patient's blood-pressure Not a very important difference perhaps, but if any lack of care be added to defect of skill, an appreciable divergence from scientific accuracy may be the result Now, if we were bidden to take the temperature of every proposer for life insurance with the thermometer, and recorded the reading without consideration of circumstances, then possibly on a warm day we might reject or postpone a man who had hurried to his consultation, because he exhibited a temperature of 100° or 101° F estimation of temperature is of little or no weight, and a chart of daily readings is necessary before any inferences of value can be drawn from the thermometric data, and there is some reason for the view that a similar procedure is requisite in the case of bloodpressure estimations It is admitted that excitement will send up the pressure Do we know how long it takes to subside in different persons? Can we be sure that the normal level will be reached after ten minutes' conversation of the most soothing character?

Now we are told by those who have carefully investigated the matter, that the blood-pressure in any individual remains remarkably constant, that fact must therefore be regarded as established. But one may find in one's own case that the pressure may differ on two succeeding days by as much as 30 mm. Hg, owing to

Some Reflections on Insurance Practice.

By W CECIL BOSANQUET, DM, FRCP
Physician to the Brompton Hospital for Consumption and Diseases
of the Chest, Medical Officer to the Guardian Assurance Company

HE work of the insurance medical officer lies chiefly in that ill-developed branch of professional study-dismissed in the textbooks in a few perfunctory lines—prognosis, and prognosis is merely prophecy, with an assumption of knowledge (gnosis) to take the place of the more occult claims of the professors of other branches of the prophetic art Now it is not in accordance with the dictates either of practical wisdom or of professional etiquette for a prophet, even at editorial command, to explain "how it is done ", and there is a disagreeable possibility that he may have less honour in his own country, the insurance office for which he works, than he might seem to claim by formulating any definite views in print Nevertheless, a minor prophet may perhaps be excused for submitting his difficulties and doubts to the consideration of more accomplished and experienced colleagues, with a view to comparing notes receiving advice

In looking back over more than twenty years of work, one is struck both by the persistence of venerable problems and by the supervention of certain new theories and practices, which may give rise to difficulties of their own. Foremost among the latter is the attention now paid to the arterial blood-pressure and the invention of instruments of precision for its measurement. The introduction of the sphygmomanometer may be compared with the invention of the clinical thermometer, which gives us a scientific record of the temperature of the body instead of a mere sense-impression.

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some accident or personal peculiarity, and it eems possible that the circulatory arrangements of a proposer for life insurance might behave with equal direspect to authority. As we usually only see him on a single occasion for a few minutes, we might catch him at a moment when he is above or below his normal level to a considerable degree Occasionally the pressure seems to vary upwards and downwards within a very few minutes, as in the case of a man seen by me recently, who was known to suffer (he did not actually suffer in any conscious way) from high tension I could easily appreciate the difference with my finger, and verified it with the sphygmomanometer, which showed a tension of 200 mm Hg at one moment and 175 mm shortly afterwards-I quote the figures from memory Such possibilities would suggest that a proposer who exhibits at examination a high degree of pressure should at any rate have the opportunity of being re-examined after an interval of time The further question then arises, as to whether it is possible for one who is the subject of chronic hypertension to pursue such a regimen of diet and drugs that his blood-pressure is temporarily reduced to normal level when he appears for examination or re-examination, and if so, how we are to guard against such a source of eiror I seem to have read of glycosuric persons, in days gone by, somewhat similarly eluding the vigilance of the medical watch-dog

Granting, however, the accuracy of the reading obtained, how is the hyperpietic applicant for life insurance to be assessed? Are we to take some arbitrary figure, such as 180 or 200 mm Hg, and reject without appeal all who exhibit it, while we rate up those who come a little below this figure—say, those over 160? There would, at any rate, be some other factors beside the blood-pressure to be taken into consideration. In the first place, the condition of the arteries. This must be ascertained by the finger, and it is possible to wonder

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whether the tendency to rely on instrumental measurement of the blood-pressure may not lead to diminished accuracy of digital examination, and direct the greater amount of attention to what is quite possibly the less important feature A systolic blood-pressure of 160 mm with damaged arteries is quite likely to indicate as much risk of rupture as a higher degree of pressure within good elastic vessels We have, too, to consider the condition of the heart and that of the kidneys a man presents—and one may meet with such occasionally-a high degree of tension along with an apparently normal heart and good kidneys, must we necessarily assume that these last organs are bound to suffer before long? Is it not possible that in some individuals the mechanism is set at a higher level than the average, and that such may continue in good health indefinitely, without the supervention of renal or cardiac troubles? The question can only be solved by the provision of a large body of statistics, and it may be doubted if an adequate collection of data is at present It would be a great comfort to have an accepted sliding-scale which took all the factors into consideration and obviated the need for individual judgment and its resultant anxiety, but it would need a subtle mathematical calculus to work it out

Incidentally one may wonder as to the advisability of telling a patient whom we find to be the subject of high blood-pressure, of the existence of this condition, or whether, as in the case of a movable kidney accidentally discovered, we should keep our knowledge to ourselves and merely give good advice as to the course of life to be pursued. In any case tact is necessary, as one sees cases from time to time of previously active men reduced to a melancholy condition of semi-invalidism and uselessness owing to the constant terror that they may suffer from some grave accident if they make the least exertion, and one wonders whether the fear and anxiety

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one for actuarial calculation But as doctors we should surely encourage the idea

Another set of cases which, though not exactly new since my earlier days of insurance practice, are becoming more numerous and important as time goes on, are the proposers who have in the past been operated on for gastric or duodenal disease, undergoing what a physician may call collectively gastro-enterostomy, though more exact terms are applied by surgeons to the varieties of this procedure What is the outlook for such persons? One has heard that they are liable—even when the operation has at first resulted in alleviation of their symptoms—to develop fresh ulceration in the jejunum, owing to contact with the acid gastric contents, and even in some instances to suffer from cancer Now it is difficult to understand why cancer should result from this operation any more than it does after other procedures, such as that for removal of the appendix Some of the instances reported may have been recurrences of what was really malignant disease at the time of the operation, others may merely represent the normal liability to cancer, which is not lessened by such intervention On the whole I am not inclined to regard this risk as serious The liability to jejunal ulceration appears to be real, but it seems likely to occur within a year or two of the operation, and the same may be said of recurrence or extension of the original ulcer Hence it might seem that after two or three years successful use of the alterations and repairs effected in their alimentary canal, these proposers should at any rate be insurable Indeed, one sees many instances of patients who have been apparently restored to complete digestive capacity by this means, and who seem destined to live as long as the average man Possibly, in view of all the circumstances, it would seem safer to wait for some years after the operation, before accepting these cases at all, to accept them with a considerable load for

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induced may not be as harmful, even to the vascular system, as a life of moderate activity and gentle exer-This consideration may not seem to have much to do with insurance practice, being a question of treatment, but it is becoming recognized that, just as a shepherd is desirous for the health of his flock-for their commercial value, it is true, not for their personal convenience—so the insurer may be interested in, and even take steps to ensure, the health of the insured Thus we hear that some insurance offices in the United States of America offer their clients a yearly medical examination free of charge, with a view to early discovery and treatment of unsuspected ills Certainly the idea appears to have something to commend it, as we are bound to believe that, viewed statistically and in bulk, human life is prolonged by medical treatment, and that the earlier this is applied, the better Curiously, perhaps, one hears that one or two insurance offices in our own country which have been attracted by this idea, are at the same time those which have been disposed to dispense with a preliminary medical examination of candidates The psychology of this combination is not very clear, unless we suppose that the free examination after insurance is merely of the nature of an additional inducement to "walk into my parlour" How far it would act as such is a matter of experience, for while the prospect of getting something—even a medical examination—for nothing is in itself attractive, and a yearly overhaul might seem a wise precaution (even as persons of outstanding courage are said to face the terrors of the dental chair at yearly, half-yearly or even shorter intervals), there are quite a number of timid souls who dread the ordinary examination for life-insurance in case it should reveal to them some hidden weakness, of which they would seemingly prefer to remain in ignorance The estimation then of the value of the additional bait as against the increased cost of medical services is

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would necessitate rejection, with the advice to consult a specialist, hope being held out that operation might produce a sufficient degree of cure to enable the applicant to be accepted subsequently

The deafness resulting from such ear-disease may also give rise to questions as to its effect on the proposer's prospects of longevity. It might seem at first sight that in these days of danger from fast vehicles on the roads, any defect in a warning sense would be a source of definitely increased peril, and would necessitate an increase in the premiums payable, while in cases of recent deafness affecting one ear, there is special difficulty in localizing the source of any sound, and so theoretically risk of mistaken inferences as to the direction from which danger may be approaching After a time, it would seem that the possessor of only one good ear learns to carry on as satisfactorily as does a man with only one eye How, then, are we to judge of the degree of deafness that requires rating up, and how is the increased rate to be determined? I know of no definite guiding principle If the subject realizes his infirmity and takes greater precautions in consequence, using his eyes instead of his ears to secure his safety, he may even be a better life than one who trusts too much to his hearing, and a cautious deaf man may well be more likely to survive than a rash and heedless " jay walker" who possesses all his faculties Yet we make no effort to estimate the qualities of prudence and circumspection, even in the "Friends' Reports," which are usually very unhelpful documents

Some cases of otorrhoea are tuberculous in nature, and that consideration leads on to the difficult subject involved in the estimation of risks arising from tuberculous infection. And, first, as to the importance of a family history of the disease. I have not been specially impressed by my own experiences of the importance of this factor, either in the case of patients

an endowment policy maturing at an early age during the next few years, and after that for the same type of policy with only a small addition

A third matter which has influenced insurance practice to a considerable extent in recent years is the recognition of renal glycosuria and the consequent eligibility for acceptance of many lives which would previously have been declined outright. It now seems justifiable to recommend these persons as first-class risks, yet a little devil of doubt may arise in one's whether mind subconscious we are yet ciently acquainted with the after-histories of large numbers of renal glycosuries, to feel quite certain that they do not suffer in any respect from their abnormality -whether, for example, they are equally resistant to infective diseases, or whether the continued loss of a valuable nutritive material in the form of sugar may react unfavourably on their tissue-metabolism and formation of antibodies Probably the fear is groundless, but the cases are scarcely numerous enough to afford very certain statistical knowledge

Proposers suffering from chronic otorrhea have not actually added to my anxieties, since the office for which I work regards them unfavourably. Yet I have often wondered whether they might not be a source of profit, if suitably selected and loaded. Accidents in the way of intracranial complications happen to such cases from time to time, but they do not seem to be very common, taking the whole number of sufferers into consideration, whereas one sees many who live to old age without experiencing more than inconvenience and unpleasantness from their malady. Cases, then, in which there has been for some years only a slight chronic discharge, which can escape freely, seem to me acceptable with a comparatively small extra. Any signs or symptoms of activity or extension—copious or sanious discharge, headache, local pain or giddiness—

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sidence of the glandular affection, the risk of subsequent pulmonary disease would seem to be definitely greater As time goes on this risk diminishes, and probably after a suitable lapse of years it may be disregarded

Closely associated with the subject of tuberculosis is the question of the weight to be attached to a history of past pleurisy The diagnosis of dry pleurisy is often lightly made, in the presence of any obscure pain in the side, and in an apparently healthy person, if there is not any indication that the pleurisy was definitely incapacitating or accompanied by fever, it is almost necessary to disregard it Pleurisy with effusion is generally regarded as almost always a manifestation of tuberculosis, and in young persons this is probably Such sufferers should, therefore, be unacceptable for insurance for some years after their illness, and then only at a higher rate I am not quite satisfied that cases of pleural effusion occurring in middle-aged and elderly persons are also necessarily due to the tubercle bacillus Instances of such an occurrence are not very uncommon, and in many of them complete recovery appears to follow—which one would hardly expect to take place at that age, if the lesion were really tuberculous

But the most difficult of all cases are those in which pulmonary tuberculosis has actually occurred, but has apparently been completely arrested. There is no doubt that such complete recovery can take place, and that in such instances life may be normally prolonged, but the ascertainment of complete arrest is extraordinarily difficult, and relapses not infrequently occur in those who seem the most promising subjects. I know of no rules that can be laid down for our guidance in estimating individual chances, and it takes some courage to gamble on one's forecast to the extent of recommending them for insurance on any terms, at least until a long period of years has elapsed

under my care or of claims which have come before me in insurance work, but statistics seem to prove that the risk exists. It is very difficult to estimate this in individual instances, and anything in the nature of a flat rate seems indefensible There is no comparison, for example, between the increased liability to tuberculosis of a youth or girl in the early twenties, whose mother has recently died in the same house from pulmonary tuberculosis, and that of a man or woman of 40, whose father died similarly when the proposer was a child Again, the death of two parents from the disease would be much more formidable than that of In my eyes, the death of two brothers or sisters is of greater weight than that of one parent, at least if the applicant has not passed the age at which they succumbed On the other hand, although tuberculosis may apparently occur at all ages, I should doubt whether any family taint would be of importance after middle life, e g after 45 years of age Much, of course, depends on the physique of the individual before us, much on his degree of contact with the tuberculous relative and on the conditions under which they have lived together Yet physique by itself is a misleading criterion, at least in young persons, for too many cases occur in which the most robust-looking and athletic individuals develop unexpected signs of tuberculosis

What inference is to be drawn from scars of old tuberculous glands or of bone-disease, with regard to the proposer's liability to subsequent tuberculosis? Has he been vaccinated against the malady and acquired increased resistance, or has he merely proved his susceptibility to the disease and the additional probability that it will reappear in some more lethal form? Certainly a considerable number of patients with pulmonary tuberculosis show signs of old glandular trouble, and for some time after the sub-

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by death, I have seen in what proportion the fatal disease could be connected with the reason for rating up. I have noted the cause of death in all cases accepted with an extra premium by the Norwich Union Life Insurance Society, which have become claims during the last thirty years. Roughly speaking, there are a comparatively few headings under which the reasons for rating up fall. These conditions and their treatment by the offices are discussed from time to time by the Life Assurance Medical Officers' Association, and their conclusions represent the best guide to workers in this branch of medicine. I have borrowed freely from the reports of their meetings and all the quotations given in this paper come from their published Transactions.

My notes comprise 370 deaths of under-average proposers. In 180, or in 49 per cent, the cause of death could be related to the adverse points disclosed at their examinations. In just over half the number the cause of death could not be connected with the reason for rating up

The existence of a family or personal history of tuberculosis was the most common reason for the imposition of an extra. Of the 370 loaded cases, there was a mention of tuberculosis in 163. These are placed in three classes. (1) Those with a family history only of tuberculosis, (2) those with a family and personal history of tuberculosis, (3) those with a personal history only of tuberculosis.

- (1) A family history was given by 121 proposers Of these 21, or 17 per cent, died from tuberculosis, the other 100 died from other causes
- (2) A family and personal history were given by 19 proposers. Of these 14, or 74 per cent, died of tuberculosis, against 17 per cent of those with a family history only. In this group, members of a family marked by the incidence of tuberculosis had themselves

The Examination of the Under-Average Life for Insurance.

By F W BURTON-FANNING, MD, FRCP

Consulting Physician to the Norfolk and Norwich Hospital, Director of the Norwich Union Life Insurance Society

HE chief difficulty in the work of the medical referee is in regard to the lives which are neither perfectly clean, nor so distinctly impaired as to be obviously unusurable. It is the life with some flaw, of perhaps questionable significance, whose classification requires expert knowledge and often the help of a specialist. Further, it must be confessed that there is considerable difference in the treatment of these subnormal proposers amongst competing insurance offices. Many proposals are snapped up and taken at ordinary rates by one office, which had been rated up or even declined by another

The advances recently made in medicine have been especially in the department of diagnosis and are therefore of great importance to the referee in life insurance work. Many rules that were formerly followed in the assessment of lives have been proved to be eironeous. Conditions disclosed at examination which were considered to constitute an extra risk and to call for an addition to the premium are now disregarded. Others were not looked for in the old days, and are now of recognized importance.

I have thought that it would be interesting to ascertain how far the lating up of proposels who are reported to have some flaw was justified by events When these under-average lives have become claims

by death, I have seen in what proportion the fatal disease could be connected with the reason for rating up. I have noted the cause of death in all cases accepted with an extra premium by the Norwich Union Life Insurance Society, which have become claims during the last thirty years. Roughly speaking, there are a comparatively few headings under which the reasons for rating up fall. These conditions and their treatment by the offices are discussed from time to time by the Life Assurance Medical Officers' Association, and their conclusions represent the best guide to workers in this branch of medicine. I have borrowed freely from the reports of their meetings and all the quotations given in this paper come from their published Transactions.

My notes comprise 370 deaths of under-average proposers. In 180, or in 49 per cent, the cause of death could be related to the adverse points disclosed at their examinations. In just over half the number the cause of death could not be connected with the reason for rating up

The existence of a family or personal history of tuberculosis was the most common reason for the imposition of an extra. Of the 370 loaded cases, there was a mention of tuberculosis in 163. These are placed in three classes. (1) Those with a family history only of tuberculosis, (2) those with a family and personal history of tuberculosis, (3) those with a personal history only of tuberculosis.

- (1) A family history was given by 121 proposers Of these 21, or 17 per cent, died from tuberculosis, the other 100 died from other causes
- (2) A family and personal history were given by 19 proposers. Of these 14, or 74 per cent, died of tuberculosis, against 17 per cent of those with a family history only. In this group, members of a family marked by the incidence of ture.

suffered, five or more years prior to insurance, from such affection as pleurisy or enlargement of glands

(3) A personal history of past tuberculosis in the proposer, but without a family history of it, was elicited in 23 cases. Of these 7, or 30 per cent, died of tuberculosis. The manifestations which had been presented by these proposers included enlargement of glands, pleurisy, ischio-iectal abscess, and in one case the combination of pulmonary and joint disease

It would appear from this small number of cases that proposers with a personal and family history of tuberculosis represent much the worst risk, and that those with a family lustory only represent the smallest My few figures bear out the generally accepted view that the occurrence of tuberculosis in brothers and sisters is of equal importance as its occurrence in a parent According to American tables the heaviest mortality tends to be amongst those with two or more brothers or sisters affected with tuberculosis come the proposers with a history of tuberculosis in a parent and also in one brother or sister Those with one parent or with one collateral relation affected with tuberculosis present the least risk. It is noteworthy that there were instances of closed tuberculosis in these family histories—meningitis, peritonitis, and Addison's disease But when the bearing of a family or personal history of tuberculosis is being considered, it must be always remembered that there are two other points about the proposer which are of great importance—his age at entry and his weight. It is during the early years of adult life that the risk from tuberculosis is most heavy, and according to many authorities a family history ceases to have any effect after the age of thirty-five years My own small experience does not quite agree with this, and leads me to think that family history is important after the age of thirty-five For of my cases loaded for a family history of tuber-

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culosis and dying of this disease the average age on entry was just under thirty-eight. To mention an exceptional case, one proposer was accepted with a loading on account of his family history at age sixtyfive, and he died of tuberculosis at seventy-six.

Along with the age of the proposer great importance attaches to his weight, if he has a family history of tuberculosis. Amongst my cases loaded for family history and dying of tuberculosis more than half were below average weight. At the same time, as will be noted later, excessive weight is unfavourable to a less extent.

The history of past personal tuberculosis may have been affection of the lung, the pleura, the peritoneum or glands, fistula or disease of bone or of joint To be insurable at any rate the proposer who has had pulmonary tuberculosis must have been completely free from any manufestation for at least five years All are agreed that it is during this time that the chief liability to recrudescence exists After examination by an expert my office has taken many of these arrested pulmonary cases with a substantial extra, and my notes do not include any claim from In a great many reports it is said that there was a suspicion of pulmonary tuberculosis, but this uncertainty should be rarely met with in the future, when in addition to the examination of the sputum, we have the immense assistance afforded by X-ray photographs If hæmoptysis is reported it is essential to give the amount of blood raised If it was less than a teaspoonful, it was no proof of tuberculosis. It is well recognized now that pleurisy, unless otherwise explained, is to be regarded as tuberculous and as liable to be followed by pulmonary affection During the five years following an attack the percentage who develop lung disease has been put as high as 40 I would only add that the term pleurisy

is often used very loosely and when in reality the condition was intercostal rheumatism or other less important affection

There is less unanimity about the insurance of the numerous applicants who give a history of past adentis. To begin with, it must be conceded that a proportion of such cases were not tuberculous. As regards the remainder, in all probability many years have elapsed since the glands were affected and they are commonly accepted at ordinary rates, if no other unfavourable feature is presented. Amongst over 3,000 sanatorium patients the lung disease had been preceded by glandular abscess in four per cent.

One proposer was accepted for insurance with an extra because he had suffered previously from ischio-rectal abscess and he subsequently died of pulmonary tuberculosis. Of my sanatorium cases in 0.5 per cent there had been such an abscess before there was any other sign of tuberculosis. But ischiorectal abscess is more commonly seen as a complication of advanced lung disease, when insurance is put out of the question. It is said that about 12 per cent of all cases are due to the tubercle bacillus.

Renal or vesical tuberculosis is occasionally reported in the past history and there is general agreement as to its treatment. Five years must be allowed to elapse after operation and there must be no present unfavourable feature. Genital tuberculosis is less serious, but the risk of its spread to the urmary organs must be considered and acceptance is usually delayed until about five years have passed without any untoward symptom.

Mr McAdam Eccles, on the insurance of proposers with a history of past tuberculous disease of joints or bone, gave it as his opinion that when the disease was limited to synovial membrane the recovery

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may be complete, and after the passage of some years the life may be accepted, assuming that every other feature is satisfactory. But he would not look so favourably on a case with permanent damage to joint or bone, where operation had been required and perhaps a sinus had persisted. If tuberculous disease of joint or bone had been got rid of by amputation of a limb, the late Sir George Humphry used to teach that the patient's general outlook was much improved. Amongst my sanatorium patients three per cent had suffered from previous disease of bones or joints

Excessive weight of the proposer is, next to a history of tuberculosis, the most common reason for the imposition of an extra to the premium. My figures indicate that this rating up justifies itself more constantly than any other Eighty applicants were accepted with an extra on account of overweight Of these 64 or 80 per cent died of conditions which could be connected with this over-weight. Cardio-vascular diseases accounted for the largest number of deaths in this group Next came acute illnesses, in which we assume the over-weight of the patient was a contributing factor to the fatal termination Renal disease, diabetes and diverticulities are also included To remind ourselves of our limitations m the rôle of forecasters, three proposers loaded for over-weight died of tuberculosis. As a matter of actual experience I do not think there is anything very exceptional in this liability of the over-fat person to succumb to tuberculosis Morbid excess of weight must depend on faults of metabolism which lower the individual's power of resistance to any infection Moreover it not uncommonly happens that the subject of tuberculosis goes from one extreme to the other as regards his weight. So it has to be borne in mind that while under-weight constitutes

a recognized predisposition to tuberculosis, overweight does not exclude it Dr T D Lister observed that some cases of tuberculosis "rebound from tuberculous vulnerability to arterio-sclerotic vulnerability". The proposers who were accepted with an extra on account of excessive weight and who died from causes that could be connected with this, fell short of their normal expectation by 40 per cent. So the insurance office is warranted in looking very critically at these cases and if accepted at all, in imposing a high extra and in shortening the term of the policy.

Under-weight was the condition for which ten proposers were loaded, and of these three died of tuberculosis. It is generally held that about 15 per cent of under-weights eventually manifest tuberculosis.

A history of gout is a fairly common reason for charging an extra, and according to my figures this extra is distinctly called for. Of seventeen proposers giving a history of one or more attacks of gout, in all but two their deaths could be associated with gout, 88 per cent. died of either apoplexy, heart disease, liver disease, or diabetes. As these persons fell short of their normal expectations by 30 per cent, the addition to the premium for a history of gout should be moderately heavy or the duration of the policy should be limited.

The discovery of albumen in the urine is frequently made for the first time at examination for insurance, and it often comes as a complete surprise. It has been thought that on this account alone no scheme for acceptance of lives without medical examination could answer. On the other hand, it is contended, especially of recent years, that the importance of albuminum has been over-stressed, and that allowance has not been made for several forms which are innocent. My office has taken without extra many cases regarded as

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adolescent or orthostatic albuminuma, and no claim has been made by them The presence of a small quantity of albumen in the urine of a man under thirty, without other suggestion of renal disease, and probably with low blood-pressure, would call for repeated tests If the urme passed on first rising in the morning was normal, the life could probably be accepted at ordinary rates In the cases of older insurers who are found to be passing albumen there are a number of special tests now in use If on ordinary clinical examination, particularly noting the blood-pressure, no other abnormality could be found, the candidate would be asked to submit to investigation of his renal efficiency msurance offices must on the report of a specialist before accepting a proposer with constant albuminuria, but if his report is satisfactory it is usual to issue the policy with or without a small extra, and perhaps for only a limited term, much depending on the age of the proposer and on the length of time the albuminuria is known to have existed Another reason for referring these cases of albuminuma without other evidence of kidney disease to a pathologist is the not uncommon discovery of a few pus cells and a growth of Bacillus coli or other organism on culture Such mild cases of pyelonephritis are usually soon free of all infection and insurable at ordinary rates

The detection of sugar in the urine is also a frequent and unexpected outcome of the routine examination for insurance. If the glycosuria is due to confirmed diabetes, the life is, generally speaking, uninsurable, notwithstanding the introduction of insulin in the treatment of the disease. The customary medical examination before acceptance for insurance is more justified by the frequent unexpected findings of abnormalities in the urine than by any other disclosure. We now know, however, that as with albuminum the presence of sugar in a single specimen does not neces-

sarrly denote any disease It may be due to nervous excitement or to an excessive consumption of sugar or starch, or to a low ienal threshold. On the other hand, the presence of sugar in the urine may be the only sign of early diabetes, so the life cannot be accepted until the exact significance is ascertained. Dr Langdon Brown lays down practical rules for the guidance of the examiner——

"In cases of reported or suspected glycosuria where no sugar is found, a good test is to give three ounces of sugar and to examine all the urine passed within two hours of this dose. If no glycosuria then occurs all forms of glycosuria, except the intermittent pituitary type, can be excluded. If this type is accepted the extra risk is apparently not very great. If glycosuria is originally found or occurs after this dose, the candidate may fairly be asked to submit himself to a blood-test, the complete curve being done. If this shows an abnormally low result, he may be accepted, though in case of residence in hot chimates an extra premium might be asked. If a lag curve is shown, the proposer might be accepted for a limited term of years, perhaps with a load or debt, but not for a whole life."

Urmary calculus was mentioned in the reports of five proposers who were accepted with a moderate extra. They were said to have passed stones or gravel, with colic and perhaps hæmaturia, or they had been operated on for the removal of stone. Of these five cases, four died from diseases which can, I think, be considered as connected with the reason for an extra. These diseases included recurrent calculi necessitating operation, nephritis, and angina pectoris. The last-named disease may have been an expression of the uric acid diathesis, and attention has been called to the occasional occurrence of renal colic and angina pectoris in the same patient. It is recognized that the risk is considerable of another stone being formed in

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a person who has once suffered from calculus. More than ordinary care must be taken at his examination to be sure that no signs or symptoms exist, and then he will be usually charged some extra. The exact amount will partly depend on the length of time during which he has been wholly free from symptoms. Mr Jocelyn Swan has advised that if seven or eight years had elapsed with no suggestion of recurrence the life could be accepted at ordinary rates, but only after exceptional scrutiny of all features.

Regarding Bacillus coli infection, there is some difference of opinion amongst insurance examiners, as to how much importance should be attached to a history of past bacilluria or pyelitis or cystitis. As a rule I think the proposal is accepted at ordinary rates, if a year or two have elapsed since there was any symptom and if a laboratory report states that the urine is normal and sterile at the time of examination But I would mention a recent claim for death due to suppurative pyelonephritis this case the urine was examined at a laboratory and found normal, though two years previously B coli pyelitis had persisted for a year. This length of duration of infection indicated exceptional severity and was an adverse feature. Mr. Jocelyn Swan is of opinion that a bacilluria is seldom completely cured and that although a specimen of urine may to ordinary examination appear normal yet a catheter specimen will show the bacilli and recurrence of symptoms may occur Mr Swan would not accept such people as first-class lives and remarks on their special liability to form a calculus

In every medical report form there is a special question about otorrhea. Until lately there was a tendency to regard very seniously any description of discharge from the ear. More recently, however, views have somewhat changed. Amongst proposers

sarily denote any disease. It may be due to nervous excitement or to an excessive consumption of sugar or starch, or to a low ienal threshold. On the other hand, the presence of sugar in the urine may be the only sign of early diabetes, so the life cannot be accepted until the exact significance is ascertained. Dr Langdon Brown lays down practical rules for the guidance of the examiner ---

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not been connected with dental sepsis. Some of these do not necessarily shorten life, and it is thought that the most injurious affection is that of the apices which can only be detected by radiography. So that unless the disease of the gums or of the teeth is marked I think the office may be advised to take the risk

Asthma was reported in the proposals of thirteen applicants for insurance, who were accepted with a loading. Eight of these died from chest disease, four from pneumonia, two from asthma, and two from tuberculosis. This heavy mortality occurred in cases whose asthma was described as slight, and who had no signs of bronchitis, emphysema, or heart affection. So unless the attacks were very slight, and have been absent for the previous year or two, and unless everything else appears favourable, asthma is a bar to insurance.

The record of the blood-pressure gives perhaps more useful information to the insurance medical officer than any other one point in the examination The applicant with a systolic reading of 170 or more would be postponed or declined, whatever was his age Of eleven men accepted with a loading because the bloodpressure was consistently near this figure, we had claims from eight who died of cardio-vascular diseases But the examiner is faced with many difficulties An everyday experience is to find the pressure raised by nervousness, and it is often necessary to take successive readings, perhaps at intervals of some days are different rules for the taking of the diastolic pressure, and it is a matter of doubt as to the importance to be attached to "arteries thickened in advance of age," but without rise of blood-pressure Assuming that there is no suspicion of renal or of cardio-vascular disease, a relatively high blood-pressure has much less significance in younger lives than in those over forty

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to my office who were loaded because of otorrhea, there have been seven deaths, but in no instance could the cause of death be connected with otorrhea On the other hand, out of a total of 2,021 deaths from all causes, in six, death was caused by otorrhea which had only presented itself after acceptance The experience of several offices points to otorrhea being an uncommon cause of death Mi Herbert Tilley has dealt with otorihea and life insurance He mentioned tuberculosis as one cause, though more especially in the otorrhea of children. said that the presence of pain in the side of the head or ear with discharge would make acceptance impossible But if a mastoid operation was performed and the result was completely successful the life could be accepted after the lapse of a year there is blood with the discharge or if vertigo is complained of operation must be carried out before the candidate can be insured Then Mr Tilley gave it as his opinion that although every case with perforation of the tympanic membrane ran some risk and needed some extra to the premium, a great deal depended on the exact situation of the perforation and on other points which only an expert could advise upon Mr Tilley would accept at ordinary rates a case where the perforation had healed and there had been no discharge for a year

The subject of pyorrhea raises a good deal of contention. We have it on the authority of Sir Frank Colyer that some degree of pyorrhea is present in all but a few people over thirty years of age. During the last thirty years my office had two claims for death due to septicæmia from pyorrhea. But the pyorrhea was not noted in either on examination at entrance and of cases in which it has been noted we have had no claims that could be ascribed to it. There are few diseases nowadays which have

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than of death He showed that the causes of death were few, and as regards perforation, "that this does not occur more frequently amongst patients with a past history of ulcer than in patients with a past history of perfect health " It has been customary to accept with a moderate extra any case who has been quite free from symptoms for two or three years and perhaps to look more favourably on the case treated by operation But the recent trend of opinion has been the other way, and emphasis is now being laid on the risks pertaining to surgical treatment of ulcer It is being claimed that the end-results of medical treatment are better, and that, provided the case has been taken in hand in an early stage, relapses can be again cured by the physician and risk to life averted. On the whole it would appear that while the first two or three vears after recovery are the most uncertain, all danger of recurrence is not passed until a much longer time has elapsed.

From the number of cases taken for insurance with a small load, because they had been operated on for gall-stones, we have had no claim. It is thought that these lives may be accepted at ordinary rates if a year or two have passed after operation and if there has been no sign of cancer or of adhesions or of ventral herma

The diagnosis of heart conditions has been so much improved by recent work that records of past expenence are of little value Claims due to death from diseases of the heart and vessels far outnumber those due to other causes and in our office reached the percentage of 28 4 So that the importance of the report on the state of the heart by the examiner for life insurance will be appreciated. He is particularly required to satisfy himself as to the efficiency of the heart, by inquiry about any symptoms, and in cases of any doubt by the use of tests Of the many forms of irregularity of cardiac action it is now known that sinus arrhythmia is of no significance Extra-systoles are the most common form of irregularity, and their interpretation admits of some difference of opinion Dr F W. Price holds that a person who presents no other abnormal sign apart from extra-systoles can be accepted at ordinary rates But there is the possibility of its depending on some myocardial change As regards other forms of irregularity the opinion of a cardiologist would be taken Undue frequency of the pulse often presents difficulty this may denote something more serious than nervousness Our attitude towards murmurs has changed a great deal, the examiner must chiefly distinguish between the func-tional and the organic murmur In regard to the latter, much depends on the form of valvular lesion and on associated conditions

A large and apparently increasing number of proposals are accepted with an extra because of a history of gastric or duodenal ulcer. My own records give only one death amongst this group and that was from cancer But according to modern views the supervention of cancer on ulcei is so rare that we suspect the diagnosis of ulcer was incorrect Dr T Izod Bennett has made the important point that these ulcers constitute a risk of ill-health rather

without showed that the integument could be moved over the without showed that the integument could be moved over the swelling, in the same way, examination from within made it clear that the swelling did not arise from the buccal mucous membrane T concluded that the lump could only be a lipoma arising from the sucking pad One week later the lump was no longer palpable

On looking up the anatomy of the region, I discovered for the first time the existence of the facial lymph gland—further proof that more time could be spent with profit in the study of the lymphatic system a result of this lesson, I have often palpated the cheek for enlargement of this gland, but with negative result,

WK, aged 23, was sent to me with a swelling of his left cheek, except in the following case history that two years previously a similar swelling had appeared on his right about and after some washes it have a contact the right about and after some washes it have a contact the right about and after some washes it have a contact the right about and after some washes it have a contact the right about and after some washes it have a contact the right about and after some washes it have a contact the right about and after some washes it have a contact the right about a contact the right and right are right. which was painful only when he washed his face on his right cheek, and after some weeks it burst externally on the right cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some weeks it burst externally. An one of the cheek, and after some of the cheek, and after some of the cheek.



Fig 2 Scar resulting from spontaneous rupture of an abscess due to infection of the facial lymph gland. The gland on the opposite side was found to be enlarged and tender.

was a lump the size of a walnut, having the same physical characteristics as the case cited above The orifice of Stenson's found to be enlarged and tender duct was examined, and it appeared normal and ejected saliva Under general anæsthesia an incision was made on the buccal

Adenitis of the Facial Lymph Gland.

BY HAMILTON BAILEY, FRCS

Late Surgeon, Dudley Road Hospital, Birmingham

HE facial lymph gland, so named by Kuttner, is an inconstant gland lying on the buccinator in close relation to the facial vein (Fig 1) It receives from the side of the nose afferent lymphatic vessels, which in turn communicate with the parotid



Fig. 1 The relations and connections of the facial lymph gland

plexus Efferent channels from the gland drain into the submaxillary and superficial cervical glands. The facial gland shares with all other lymphatic glands the liability to infection, and on this account the possibility of its existence should be better known

A young woman complained of a lump in her cheek Bi-digital examination revealed a rounded lump the size of a hazel nut, about an inch posterior to the angle of the mouth Examination from

Spasm of the Colon: Its Allergic Nature.

BY A A BISSET, M D

LLERGY is a condition of altered reaction on the part of tissue cells to foreign chemical agents. It may be regarded as a reaction against definite widely varying substances that in the same doses are harmless to the normal organism. This allergic condition has its most common examples in asthma, serum disease, some forms of migraine, eczema, urticaria, angio-neurotic ædema, and hay fever, but many writers have noted a spastic condition of the colon, associated with a neurotic type of individual, many of whom are definitely neurasthenic and even hypochondriac

Enterospasm has been recognized for some considerable time—Spigelius and Riolan, quoted by Bedinfield, observed in the cadaver narrowings of the gut, in 1645 and 1649, "angry contractures" Spasm of the colon or enterospasm is quoted by Hurst² as being first described by John Howship in 1830 and subsequently by Cherchewsky in 1883—Fleiner and Hawkins, by their publications first brought into prominence its frequency on the Continent and to a less degree in England

Enterospasm may be described as a condition of the gut showing a contraction of the longitudinal and circular fibres simultaneously. This contraction is accompanied by pain, which may disappear long before the spastic condition of the bowel has subsided. The pain is most commonly found in the lower abdomen, especially on the left side, and is aggravated by defectaion and aperients. The stools may be small, pencil shaped, or composed of marble-like pieces of

aspect of the swelling While dissection was in progress the capsule of the gland was entered and about a drachm of pus escaped. The remnants of the gland were removed, and the mucous membrane, which was left open, healed readily

Differential diagnosis —A localized swelling of the cheek in the position indicated, a swelling not attached to the integument or the mucous membrane, may reasonably be one of the following —

- (1) A lipoma developing in the sucking pad of the
 - (2) A mixed tumour or a cyst of a molar gland

(3) Adenitis of the facial lymph gland

The sucking pad is a ball of fat situated between the masseter and the buccinator Well developed in infancy, it atrophies during childhood. On occasions a lipoma may arise from the vestige which remains

The molar glands are four or five in number They lie on the outer side of the buccinator, their ducts piercing that muscle to open into the vestibule of the mouth L R Fifield described two cases of a mixed tumour of a molar gland giving rise to a localized swelling in the cheek

Few individuals possess a facial lymphatic gland, consequently, infection coursing along the lymphatics of the cheek usually passes directly to the submaxillary nodes. When a facial lymphatic gland is present, its enlargement will continue to perplex the diagnostician unaware of its existence.

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Enterospasm may be described as a condition of the gut showing a contraction of the longitudinal and circular fibres simultaneously. This contraction is accompanied by pain, which may disappear long before the spastic condition of the bowel has subsided. The pain is most commonly found in the lower abdomen, especially on the left side, and is aggravated by defecation and aperients. The stools may be small, pencil shaped, or composed of marble-like pieces of

fæces moulded together, and the passage of mucus is often in evidence. Any part of the gut may be affected and the condition may simulate various acute conditions such as appendicitis, gallstones, neoplasm, movable kidney, gastric ulcer and ovarian disease. (Lier, Hawkins, Ryle's)

The cæcum in cases where the transverse and pelvic colon are affected may be found to be distended, noisy and occasionally tender X-ray picture, following a barium meal, shows a definite narrowing of the lumen in the affected area, with the haustrations lost Kantor, notes that ileo-cæcal incompetence and filling of the appendix is frequently present the emptying time is also delayed. The cause of this spastic condition is attributed by Hurst to reflex irritation from within the intestines, poisons circulating in the blood, reflex causes, and as a result of tabes and chronic appendicitis. Morgan incriminates a preponderance of vagal stimulation causing motor activity or to lessened irritability of the sympathetics.

Eggleston¹³ says the principal ætiological factor is nervous instability, spasm and secretion of mucus being due to disturbance of the sympathetic and parasympathetic, and that the mucous type of colitis is an end form of the spastic type. Jirasek¹⁴ states that degenerative lesions in the cells of Auerbach's plexus may be the cause of enterospasm, whilst Steindl¹⁵ found degenerative changes in the medulla and pons localized near the dorsal nucleus of the vagus in cases of intestinal spasm. Alessandrini¹⁶ attributed the spasms to the lowering of the blood calcium.

Melli¹⁷ states that asthma may be produced by the inhalation of a substance and the ingestion of the same substance may cause gastric intestinal disturbance without asthma Rowe¹⁸ and Duke¹⁹ have shown that gastro-intestinal symptoms may be due to food allergy, and Hollander,²⁰ in the description of five cases of

SPASM OF THE COLON

mucous colitis which proved to be due to hypersensitiveness to foods, undoubtedly describes symptoms of colonic spasm Andersen²¹ reported several cases where the abdominal pain was due to hypersensitiveness to Laroche, Richet and Saint Gerons23 have also recorded cases of abdominal allergy A F Hurst²³ states that "If over-activity of the motor fibres occurs alone, enterospasm results This is analogous to the production of pure spasmodic asthma by irritation of the bronchial mucous membrane by some peculiar atmospheric condition in an individual with an abnormally irritable broncho-motor centre In other cases the spasm is associated with increased secretion of mucus, and mucous colic results This is analogous to the more common cases of asthma, in which the bronchial spasm is accompanied by excessive secretion of mucus" Hawkins24 comments on the association of this condition with asthma and quotes a case where this link had occurred in the same individual Echer and Biskind²³ have shown by direct observation and the cinematograph that the intestines of rabbits during anaphyshock showed irregular contractions lactic incomplete peristaltic rushes in the small intestine and peristaltic rushes in the cæcum and lower colon

With the allergic nature of this condition in view, a series of cases have been examined by the protein skintest to determine the exciting protein or proteins, if any Unfortunately, the identification of the causative protein is a matter of difficulty, and reaction to several foods is a common occurrence (Duke²⁶), Cook and Van der Veer²⁷ show that skin sensitiveness is present in about 15 per cent of normal subjects. The ultimate proof cannot be based on the dermal reaction alone, but on the recurrence or increase of the symptoms after the ingestion of the suspected food, or their disappearance on its withdrawal from the dietary

In all the cases of the series the symptoms were of

fæces moulded together, and the passage of mucus is often in evidence. Any part of the gut may be affected and the condition may simulate various acute conditions such as appendicitis, gallstones, neoplasm, movable kidney, gastric ulcer and ovarian disease (Lier, Hawkins, Ryle's)

The cæcum in cases where the transverse and pelvic colon are affected may be found to be distended, noisy and occasionally tender X-ray picture, following a barium meal, shows a definite narrowing of the lumen in the affected area, with the haustrations lost Kantor, notes that ileo-cæcal incompetence and filling of the appendix is frequently present the emptying time is also delayed. The cause of this spastic condition is attributed by Hurst to reflex irritation from within the intestines, poisons circulating in the blood, reflex causes, and as a result of tabes and chronic appendicitis. Morgan incriminates a preponderance of vagal stimulation causing motor activity or to lessened irritability of the sympathetics.

Eggleston¹³ says the principal ætiological factor is nervous instability, spasm and secretion of mucus being due to disturbance of the sympathetic and parasympathetic, and that the mucous type of colitis is an end form of the spastic type Jirasek¹⁴ states that degenerative lesions in the cells of Auerbach's plexus may be the cause of enterospasm, whilst Steindl¹⁵ found degenerative changes in the medulla and pons localized near the dorsal nucleus of the vagus in cases of intestinal spasm. Alessandrini¹⁶ attributed the spasms to the lowering of the blood calcium

Melli¹⁷ states that asthma may be produced by the inhalation of a substance and the ingestion of the same substance may cause gastric intestinal disturbance without asthma Rowe¹⁸ and Duke¹⁹ have shown that gastro-intestinal symptoms may be due to food allergy, and Hollander,²⁰ in the description of five cases of

SPASM OF THE COLON

stomach," which had lasted three years Diagnosis was made of duodenal ulcer, disproved by X-ray Transverse colon was seen to be spastic Had dislike to milk Skin reacted to cheese, and the intake of this article of food reproduced the pain. He had a history of asthma in his boyhood, which was known to be brought on by milk

Case 3—Dr G F, aged 62 Had history of abdominal discomfort and pain commencing two hours after a meal Appendix removed and found to be healthy Suffered from asthma for several years Had no food dislike Descending colon definitely spastic Skin reacted to egg and beef Complete removal of these from his

diet has given relief

Case 4—Miss M, aged 40, had a history of continual headache, associated with abdominal pain and constipation. No positive allergic history of any kind. No skin reaction and no food dislikes, pelvic colon was distinctly spastic. An elimination diet was instituted and the offending article was found to be due to banana, this fruit she had been eating every day. The symptoms were reproduced by the taking of a small piece of banana.

Four of the series that did not react to any protein also gave negative results with an elimination diet and had no history of any allergic symptoms

From the study of the results we may conclude that the presence of a family or personal history of symptoms of an allergic nature, combined with a positive dermal reaction and the increase or decrease of the abdominal symptoms following on the ingestion or elimination of the suspected food or foods, is conclusive that the condition in such cases is one of food allergy

The explanation of the cause of the manifestations of food allergy is difficult, but it may be primarily due to an inherited constitution which renders the individual hypersensitive to foreign proteins, or it may conceivably be, that under certain disturbed conditions of the intestinal tract, proteins which are incompletely metabolized in the course of digestion may be absorbed in such a form or in such quantities as to sensitize the individual. In addition to the presence of the hypersensitive condition, mechanical factors also must be taken into account, as the mucous membrane of the bowel when in a sensitized state is also irritable, and the bowel contents may mechanically set up a response

a fairly constant nature; pain in the course of the colon, abdominal distension and discomfort and a palpable spastic condition of a part of the colon, with or without mucus formation In many of the cases the pain was as severe as might ordinarily be expected in an acute inflammatory condition, but in others the pain was of a less severe character and more chronic All had other manifestations of alimentary disorder of varying degree and character, such as belching, heartburn, nausea, probably due to gastro-colic reflex

When the individual is sensitive to one or more articles of food of an unusual nature, the skin-test is not necessary, as the patient is painfully aware of his reaction, but in cases where the patient is reactive to more common articles of diet, such as eggs, milk, cheese, wheat, then we have the abdominal discomfort of daily occurrence, and the dermal test is of value Of a series of 20 consecutive cases of enterospasm whose dermal reaction was taken, 13 had a family or personal history of other symptoms of an allergic nature, whilst 10 had food dislikes Reaction positive to various proteins was obtained in 15 of the series Five of the cases did not react to any food, and all of these had a negative family or personal history The proteins to which reaction was obtained were wheat 4, eggs 9, cheese 8, banana 1, rice 1, rye 2, milk 8, cocoa 1, oatmeal 1 Several of the cases showed reaction to more than one protein

Subjoined are brief notes on four of the cases illustrating the results --

Case 1 -Miss G, aged 36, had a history of abdominal pain for several years, with passage of mucus Diagnosis of appendicitis and gallstones was made on several occasions X-rays showed definite spasm of the pelvic colon, with distension of the cocum and ptosis of the transverse colon Her mother had definite history of ædema on eating celery Reacted to wheat and cheese Elimina-tion of these articles of food had beneficial results The symptoms were reproduced on eating by mistake macaroni and, on another occasion, fish with a sauce containing cheese

Case 2 —Mr A B, aged 42, had definite pain in the "pit of the

Minor Surgery of the Rectum.

BY HARVEY JACKSON, FRCS Surgical Registrar, Middlesex Hospital

ISORDERS of the rectum and anal canal are matters of everyday interest to the general practitioner, unfortunately such cases are not subjected to the investigation and interest demanded for the recognition of the pathological lesion, and a large proportion of patients are consequently treated purely symptomatically, and as a result remain uncured The opportunity of examining and treating a large number of patients with rectal disease, shows that a considerable proportion of the patients sent up for investigation by their practitioners are labelled "hæmorrhoids" or "pruritus" A little more carefully elicited history will frequently disclose the condition for investigation, but many men would appear to be content to diagnose "hæmorrhoids" in all cases associated with hemorrhage and "pruritus ani" in all cases of irritation As the results of treatment depend, first of all, on a correct diagnosis, it is essential to determine the cause and thereby indicate the treatment necessary, for it is unsatisfactory to prescribe for a symptom without due investigation

Patients are apt to volunteer their own diagnoses, but the terms used are of a lax character, and one designation often covers a number of lesions. It is proposed to enumerate some of the more common complaints and to deal with the simpler methods of treatment available to every practitioner.

Piles —A common expression volunteered by patients is that of "an attack of the piles" What exactly does a patient refer to when making this statement? Apparently such a phrase may refer to one of several con-

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SURGERY OF THE RECTUM

peri-anal tags, and at times prolapsed hæmorrhoids Beyond such elongation and prolapse of internal piles, to the extent of their appearance at or outside the anal orifice, there are no true external piles, in the meaning that there is any pathological entity associated with those elements fundamentally the site of hæmorrhoidal formation, that is to say, there is no relationship with the anastomoses of the superior and the inferior hæmorrhoidal veins. The term should be restricted to changes in and around the anal margin. Bleeding may occur in association with the formation of a para-anal hæmatoma, should injury or infection and ulceration take place.

Peri-anal skin tags are treated with a certain amount of indifference, and dismissed without any thought of treatment, but the presence of such encumbrances at the anal margin predispose to uncleanliness, local hygienic conditions being difficult or impossible to maintain. Fæcal material is bound to lodge in the intervening crevices, the consequent stagnation and irritation may produce intractable dermatitis and pruritus, which, of course, will not respond to treatment unless the cause is removed. It is essential, therefore, in peri-anal dermatitis to bear this in mind. All that is necessary is to snip the tags off level with the surrounding tissues and dress the wound under the usual principles.

Patients attending with a history of bleeding demand a very careful and thorough investigation to differentiate the commoner condition of hæmorrhoids from the more serious affections, such as a malignant growth However, even the differentiation and recognition of the varicosities known as piles from the other affections characterized by bleeding do not finally settle the matter as far as the treatment in the hands of the practitioner is concerned. A great deal can be done by the general practitioner as apart from the consultant

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ditions, amongst which may be included the following Prolapse of hæmorrhoids, profuse bleeding from hæmorrhoids, sentinel-pile formation, development of a para-anal hæmatoma, and bleeding from other causes, such as a new growth or inflammation in the rectum Of these, the formation of a para-anal hæmatoma is probably one of the commonest, this may be distinguished by the rapid formation of a tense, tender, cedematous swelling of bluish appearance by the side of the anal canal, at the junction of the skin and mucous membrane This lesion is generally associated with an attack of constipation, the extrusion of a mass of inspissated fæces injuring a small venule in the submucous tissue, thereby producing a small hæmatoma, which is extremely painful—Such acute, tender swellings are at times designated as "external piles", they may frequently recur in some patients hæmatomata are responsive to simple means of treatment, if seen during an early stage, the application of cooling, astringent lotions, such as that of lead and opium, will alleviate the pain This is followed by hot baths and hot fomentations to induce absorption of the resultant coagulum In some cases this procedure will not result in the removal of the clot, or, maybe, the pain is intense and the patient is desirous of early relief Under these circumstances more active efforts are called for, and these consist of the removal of the overlying tissue, scraping away the blood clot and leaving a shallow ulcer without overhanging edges The resulting ulcer, as a rule, heals rapidly these hæmatomata are allowed to organize, small fibrous masses will form, and the presence of several of these, consequent on multiple attacks, may be responsible for the peri-anal tags as seen in some patients. Before going further, it may be advisable to discuss briefly the vague term of "external piles" which is

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or thrombosis In addition to these local contraindications, there are cases in which the hæmorrhoids are associated with or due to distant disease, such as cardiac disease or cirrhosis of the liver, in these circumstances it would not only be useless but inadvisable to attempt to treat the bleeding, unless extremely excessive, and then with great reservation and only by operation—such procedure in ordinary events would not be advisable The possibilities of injections should be more widely realized. In a recent case of secondary anæmia associated with profuse hæmorrhage from some mulberry-form hæmorrhoids, the blood picture returned to normal count following treatment by a matter of four injections A hæmorrhord should not be expected to be completely sclerosed after one injection, each pile may need four or five applications A refinement as far as the actual injection is concerned is the application of pure carbolic acid to the site of proposed puncture with the needle, in order to ensure sterility and avoid any possibility of pain. At times patients complain of some bleeding after the first injection, but this is of little moment, and does not contra-indicate further injections The complications of this form of treatment are conspicuous by their absence, there seems to be a small risk of infection with the formation of an abscess, this has not happened in the writer's experience, sloughing may take place, but this must be very rare, especially as far as the use of carbolic acid is concerned, also there would appear to be a slightly increased risk of fissure formation

The mode of treatment by injections as far as proctological work is concerned is not limited to that of hæmorrhoids, in fact, one of the simplest cures for anal fissure is by a similar means. Before dealing with the treatment, the diagnosis must be first considered the typical picture is acute pain during

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-unfortunately, most practitioners' treatment of hæmorrhoids rests purely in the application of one or other of the usual astringent ointments, this being the only resource apart from the more radical but very unpleasant operations, which appear to be the only alternative as far as many are concerned Ointments such as witch-hazel, and gallic or tannic acid, prove of great value in some cases if combined with the due regulation of the patient's bowels A much more satisfactory means of cure is found in the use of injections, a very valuable form of treatment as far as the patient is concerned, for, apart from the great discomfort undergone by the operative removal, there is a very great consideration in the great loss of time entailed by the restriction to bed, whereas a patient subjected to injections can be allowed to carry on with his or her ordinary duties Many people find it possible to give a little time once a week, but would find it impossible to give up the necessary time for operation The injections consist of five or ten per cent carbolic acid dissolved in almond oil Of this one gives about ten minims into the base or highest point of the pile, as a rule injecting not more than two hæmorrhoids at each visit Of course, the usual directions are given as far as regulation of the bowels is concerned This treatment is by no means recent, but it would appear that the alleviation obtainable by this measure is not universally recognized Some surgeons prefer to be a little more cautious at the commencement of treatment, keeping the patient in bed for twenty-four hours after the first injection, but with a large number of patients, as at hospital, there is little difference in the end-result

As for the choice of cases, there is little difficulty, but a few contra-indications may be mentioned these are hæmorrhoids which prolapse or are associated with anal prolapse, cases with excessive hæmorrhage, and piles with complications, such as infection

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and immediately after defæcation, associated on occasions with the passing of small quantities of bright blood, particularly in the form of streaks on the fæces A more frequent form is characterized by irritation and discharge, which appear either separately or jointly. Patients appear to apply for treatment complaining of slight discharge, peri-anal irritation, or of the presence of a swelling in the anal region, the latter frequently being described as an "attack of the piles, with something coming down". In a large percentage of cases the fissure occurs in the mid-line posteriorly, various anatomical reasons being given, in women at times it will be found in the mid-line anteriorly, in other positions fissure is a rare condition, and when it does occur, often seems to be specific

What, then can one do for an anal fissure? There are the usual forms of applications of antiseptic ointments, such as calomel ointment, alone or with an analgesic such as cocaine, and a number of cases will respond to such applications provided attention is given to the underlying constipation Cases associated with dermatitis are frequently irritated by the use of the usual ointments, under such conditions, the inclusion of an astringent and soothing substance such as bismuth will aid the skin as well as the fissure, in a still more acute dermatitis, it will be necessary to forgo ointments and apply lotions and powders until the inflammation of the skin has resolved to some extent Cases of fissure associated with marked sentinel-pile formation (a sentinel pile actually consisting of the ædematous fold of infected tissue situated around the distal end of the fissure) will not improve until this terminal preventive of drainage has been removed This may be carried out quite simply under a local anæsthetic or under nitrous oxide anæsthesia in the more timid patient, this alone will cure the whole lesion at times In many patients a reflex

SURGERY OF THE RECTUM

spasm of the anal sphincter is associated with fissure, this makes defecation still more difficult and more painful, and may need the actual digital stretching of the sphincter Beyond this stage cases have been subjected to operation in the hands of many surgeons. The actual fissure is then excised and the resultant wound allowed to heal from the base to the surface, in this form of treatment it has proved necessary to remove a comparatively large piece of skin, as this part tends to heal up much more readily than the mucous surface

Short of actual excision, what can be done for the distressing cases which will not respond to local applications? The introduction of the injection of the base of the fissure with local anæsthetics of prolonged effect has enabled defecation to take place without that awful ordeal of pain which is associated in the patient's mind with that physiological act, and with regular action of the bowels and relaxation of the sphincter, conditions are induced such as allow healing to occur The injections used are urea-quinine and a proprietary substance known as A B A, which is a preparation of anæsthesin The injection is made into the base of the fissure and also into the sphincter In all such cases if a sentinel pile is present it should be removed. Most fissures can be enticed to heal with one of the minor forms of treatment, only those with indolent, indurated fissures and of such a degree as to form anal ulcers will need excision The prolonged mactivity necessitated by operation is another point in favour of the above form of treatment, the latter being a much less tedious affair and of a much more economical nature

Pruritus ani would be less frequently diagnosed if patients were examined to the exclusion of all possible causes. The majority may be proved to be secondary to some local disease, the commonest local lesion probably being the condition which has just been discussed. It is not until it and conditions as hæmorrhoids,

other causes of local irritation, such as discharge from the rectum as in proctitis, thread-worms, the abnormalities of digestion producing irritant substances or the presence of irritant substances in the food, together with generalized disease such as diabetes or nephritis, that are excluded, the diagnosis of primary pruritus is justified. The treatment of the case is that of the primary condition, the residual cases may be treated on the usual lines of local application of sedative or analgesic substances, some of the more intractible will respond to X-ray treatment, others demand the more radical but rather unsatisfactory operative treatment

Prolapse —Some cases of this distressing complaint may be cured by the submucous injection of absolute alcohol, more especially in children, after the injection in children, the usual strapping of the buttocks should be maintained, and defæcation should be encouraged with the child lying on its side

Inflammatory changes in the rectum and colon are worthy of note in that the passage of blood as is associated therewith is very frequently put down to the presence of hæmorrhoids, and the patient is dismissed with a pot of ointment. In such cases, the patient attends complaining of "diarrhœa," but on questioning one finds that this generally means a frequent call to stool, resulting in the passing of blood and mucus only, with variable quantities of pus. As a rule, there is a feeling of discomfort in the rectum, described as a feeling of weight and distension, some patients describe a local sense of "bearing down". The simpler forms of this disease respond to local irrigations with astringents and antiseptics, some of those unresponding to this treatment, together with the exhibition of intestinal antiseptics, will react to the administration of vaccines, autogenous particularly, these are streptococcal in most cases. Of course, there are those other

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cases of specific infections by the dysenteric organisms, which have their specific forms of treatment. Other causes of proctitis present themselves from time to time, and one to keep in mind is gonococcal proctitis, this is more common in females, for anatomical reasons. Proctitis may be secondary to generalized disease, occuring in diabetes and chronic nephritis. In view of recent work on the administration of anæsthetics by the rectal route, it would appear worthy of note that a number of cases of proctitis have resulted therefrom

Apart from the use of special instruments (sigmoidoscope, etc), which demand their use by an expert, the differentiation of rectal diseases depends on examination by inspection, digital palpation and the use of simple instruments It seems that a point not well recognized is that hæmorrhoids, being the derivatives of venous radicles, are soft, resilient structures, and, therefore, are not normally palpable, hence any swelling palpable to the finger is either of a nature entirely different from a pile, or is a pile which is the site of some complication, such as thrombosis, the only other smooth globular swelling that appears in the anal canal is a polyp Malignant growths are recognizable by their irregularity of outline, induration and infiltration of surrounding and deeper structures, and their friability

The Problem of Adenoids.

By H MERRALL, MB, CHB

N experience stretching over a period of forty years, mainly devoted to the treatment of diseases of the nose, throat and ear, has enabled the writer to draw some conclusions which, he maintains, are of considerable moment in enabling us to grasp the real meaning of the condition known as "adenoids," its causation, and the best and least dangerous method of treatment. To be able to offer a simple and obvious explanation of its cause, to point out a method of treatment, which, if properly carried out, is at once efficacious, and virtually always safe, is to promise a very great deal. An experience involving operations on over 5,000 cases of adenoids and enlarged tonsils, without a single incident dangerous to life displaying itself, may, however, offer some justification

This experience also sheds light on the nature, cause, and best form of treatment of a number of other ailments in children, almost entirely due to the condition known as adenoids. To this class belong the following Mental backwardness, flat-foot, lateral curvature of the spine, deformity of the maxilla and crowded, overlapping or prominent teeth, incontinence of urine, deafness, running ears, together with perforated eardrums, many cases of asthma, minor epilepsy and stammering

When we find that between 40 and 50 per cent of children in this country are more or less affected, when we realise that it has been found that 84 per cent of the children forming the most backward members of the classes in a school suffer from adenoids, when we also discover that flat-foot in these children is general, the importance of the question from a national standpoint

becomes evident

The causation of adenoids—Adenoids are swollen and infected lymphatic glands A swollen tonsil may be a healthy tonsil, swollen through doing its duty, through the performance of its proper function It is only when congestion is succeeded by infection or through the swelling—in the case of the pharyngeal tonsil—becoming obstructive, or through the addition of lymphocytes to the blood consequent upon the greater activity of the lymphatic tissue lining the pharynx and naso-pharynx producing leucocytosis, that the other effects follow For the period of youth, when adenoids are met with, is the period when we suffer or acquire immunity from the exanthemata and recurring colds Adenoids and catarrh are both of them the expression of the conflict between the defences massed at the very gateway of the body, and are exposed to the air and the invading micro-organisms

Elsewhere in the body the function of lymphatic glands has long been recognized as being that of defensive fortresses If a vaccinated arm becomes inflamed from irritation, the nearest lymphatic gland will be found to be swollen But the function of the glands in the circle of Waldeyer, in virtue of the lymphocytes which they manufacture, is much more active than that of a mere blockhouse Like the phagocytes in the blood whose numbers they go to swell, they wage an actual warfare in the throat on the micro-organisms causing colds, influenza, and the exanthemata A swab from any human throat will reveal the presence of mucus, lymphocytes and a large number of germs of disease Some of these are living entities, some are dead bodies of dead microbes are frequently seen undergoing absorption inside the bodies of the lymphocytes If the secretion on the swab is purulent, there will be found a large number of dead lymphocytes and dead microbes The cause of adenoids and enlarged tonsils is over-

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PROBLEM OF ADENOIDS

ing ears was noted by Hippocrates Neither the one nor the other symptom is seen in the vast majority of instances without adenoids being present. In the upper jaw, on the completion of the first dentition, there are ten teeth. On the completion of the second dentition there are sixteen. If the roof of the mouth be altered in shape so that it forms a Gothic rather than a Norman or flattish Norman arch, as is normal, the sides come closer together, and there is less room for the teeth, so that they appear edgeways, or even overlapping each other. These are not cases for the dentist—there may be nothing whatever the matter with the teeth, usually they are quite sound, but both in the upward and in the forward bending of the maxilla, there is not room enough in the alveoli for the complete set of teeth

Discharging ears and deafness—The escape of pus from the ear and the consequent deafness are not in the vast majority of instances primarily ear trouble. The secondary eczematous rashes result from the irritation of the pus on the lining of the external auditory meatus and outer ear. But the pus will be found in most cases to arise primarily from an infected or suppurating naso-pharyngeal tonsil (adenoids), through the Eustachian tube to the meatus, perforating the tympanic membrane or its way

Incontinence of urine — Unconscious urination during sleep and inability to retain the urine during the hours of work and play are found in a certain proportion of cases of adenoids and enlarged tonsils. Both are immediately cured in almost every case by operation on these lymphatic glands in the naso-pharynx.

Stammering and minor epilepsy —Every rhinologist of experience is, we believe, able to point to the cure of certain cases of epilepsy and stammering by operation on adenoids

Operation —A few words as to the type of operation suitable for these cases The present writer ventures to

work of these defensive structures—overwork induced by the presence of the microbic causes of colds, influenza, pneumonia, etc., and the exanthemata. The excessive production of lymphocytes thus occasioned leads to an alteration in the ratio of leucocytes to the red blood-cells in the blood in favour of the former, and thus anæmia is produced

Causation of deformities associated with adenoids —Anæmia leads to disinclination to exercise the muscles and to habits of lounging Standing with the weight mainly resting on one foot causes the arches of the feet to sink When an individual stands with his weight resting on one foot, say the right foot, his left hip will be found to be raised to a higher level than his right, and if his spine were not bent laterally his head would lean over to the right in such a grotesque position that every onlooker's attention would be called to it Curved spine is not caused by any form of school desk, as has been suggested, in the main it results, like flat-foot, from muscular flabbiness These children are all anæmic, and anæmia discourages exertion Without exercise muscles will not either grow strong or remain strong The remedy is to be sought in treatment of the underlying conditions of anæmia, removing its cause, and in the performance of regularly repeated forms of muscular exercise With the removal of the cause, a good schoolmistress who will see that her pupils sit and stand upright is worth all the special desks and forms of mechanical apparatus in the world

Mental backwardness — The mind-wandering to which Guye gave the name of "aprosexia," is also mainly the result of anæmia—It is so frequently found associated with adenoids that in certain schools the average of adenoids amongst bad scholars has been found to be over 80 per cent

High arched palate and crowded teeth — The association of crowded and prominent teeth with discharg-

PROBLEM OF ADENOIDS

patient moves, the mouth propped open to commence with, the employment of a suitable gag which does not interfere with the action of the tonsil guillotine, and the aid of a skilled anæsthetist, it is possible to perform this operation both on adenoids and tonsils in the short interval of time which intervenes between the occurrence of unconsciousness and the abolition of the coughing reflex. It is even possible to do the operation after making certain that the coughing reflex is present by tickling the throat and so exciting a cough before introducing a curette into the throat.

Surgical operation in these conditions is, however, not by any means all that is required. After recovery from the effects of the operation it is necessary that the patient performs certain muscular exercises twice daily, breathing deeply and easily through the nose the while Skipping with or without a rope is an excellent form of exercise, by increasing this exercise by one skip per day the child's muscles develop, his heart is strengthened and his chest enlarged So far from any strain falling on the cardiac muscles, these exercises actually help it to perform its function of propelling the blood, for it is by the aspirating effect of the movement of the chest walls and diaphragm in virtue of the valves in the veins and muscular contractions that the blood is brought back to the right side of the heart These exercises being performed while the mouth is closed, the habit of mouth-breathing, which otherwise may persist, is overcome

assert that the danger of death following on or occuring during the performance of an operation for
adenoids and enlarged tonsils is in the main avoidable.
In most cases on record in this country where death has
resulted from this operation, the coroner has, in
accordance with the medical evidence, recorded the
verdict "Death from status lymphaticus," the belief
being apparently that an enlarged thymus gland has
chosen the moment of operation in some mysterious
manner to encompass the death of the patient. But
every case of adenoids and enlarged tonsils is obviously
a case of status lymphaticus

In my opinion, the cause of death in the majority of these cases is asphyxia We are prevented by the coughing reflex from being choked by the passage of saliva or food through the widely open glottis the anæsthetic be pushed in these cases beyond the point at which this reflex is abolished, blood is in danger of flowing into the larynx, trachea, and lungs Nothing in particular may be noticed until the blood coagulates and respiration ceases With the patient lying down, either on his back or on his side, respiration is impeded to start with If the mouth is not propped open to admit of the insertion of the gag when the anæsthetizing apparatus is removed, valuable time is lost in forcing it open, the patient moves, and more The child cannot gas, ether or chloroform is given cough and is in danger when bleeding occurs It should not be forgotten that from an affected naso-pharyngeal tonsil (adenoids) alone from 6 to 8 ounces of blood may escape at the first incision of the curette hæmorrhage has peculiar features, masmuch as it is ınstantaneous, of considerable volume, yet ceases spontaneously almost at once

By having the patient in a sitting posture, with a frontal mirror or lamp on the operator's head, so that the light can be directed into the mouth however the

original error as to make it, and not the secondary deformities, the object of attack, holds out high promise of success, unattainable by other means, in all but very exceptional cases It is generally agreed that congenital dislocation of the hip is a local retardation of development, that, in the first instance, it is a local hypoplasia affecting more particularly the posterosuperior quadrant of the acetabular rim The actual cause of the aplasia is indeterminate and obscure, but it is at once linked up with other local retardations such as hare lip and spina bifida It seems reasonable to postulate, therefore, that the actual type of aplasia depends upon the age of the embryo and upon which tissue is most actively growing, and, therefore, the most vulnerable at the time when the noxious influence first impinges on the growing organism The condition just before birth is one of a normal femoral head, normally placed opposite an acetabulum, the normal, retentive postero-superior rim of which is absent The usual intra-uterine position, it will be recalled, is one of flexion of the thighs, and naturally the anterior, flexed muscles are slightly contracted at the actual moment of birth It will readily be appreciated, therefore, that the aplastic hip has a crisis to face when first the legs are extended at the hip joints, as the leverage of the shortened muscles may be sufficient to shoot the head up over the deficient acetabular shelf, and dislocation occurs If the first crisis is satisfactorily overcome, the assumption of the erect posture and the first attempts at walking are usually associated with a gradual migration of the femoral head up on to the dorsum ilii It appears to me, after some little experience of this condition, that a useful purpose would be served by insisting that there are, therefore, two types of congenital dislocation—the one the sudden, explosive, post-natal type, and the other the more gradual post-ambulant type The difference is

A Reconsideration of Congenital Dislocation of the Hip in Childhood.

By JOHN BRUCE, MB, ChB

HERITAGE of developmental error or deficiency, with its train of pain, unhappiness and economic encumbrance obviously commands the close attention of all medical men. The treatment of these anomalies bulks largely in the routine work of children's hospitals, and it is in the attempted restoration of deficient parts, or in the production of artificial or natural substitutes, that surgery as a creative art reaches, in many opinions, the pinnacle of its great achievement

Congenital dislocation of the hip joint, important economically because of its frequency and the tragic sequelæ of the untreated or relapsed cases, has always attracted a great deal of serious attention. Many and varied lines of treatment have from time to time been suggested, but there is now, fortunately, a growing opinion that the results are not satisfactory and that efforts must be redirected into other channels if we are to approach the attempted alleviation of this error in a spirit of confidence and assurance. In this, as in all other conditions, a correct, working conception of the etiology must form the key to reasoned and successful treatment, and while in this country there is common agreement about the origin of the anomaly, its lesson is apt to be misread, with disastrous consequence

I have been privileged to observe a method of treatment which, based on such a correct estimation of the

CONGENITAL DISLOCATION

then an estimate that 50 per cent of these cases had either completely redislocated, or subluxable, hips, of the 50 per cent of cases that had stayed reduced, a large number suffered from varying degrees of incapacity (tiredness in walking, pain in the hip joint, etc.), because of anatomical irregularity, faulty joint mechanics, or rheumatoid changes. It is apparent, therefore, that the time is ripe for a reconsideration of the whole problem

The usual mode of attack in this abnormality, at the present day, is well stated by Jones and Lovett¹ in their classical work "Except in very unusual circumstances, reposition by manipulation should be attempted in all cases under 10, and in certain cases older than that" Fairbanks,² too, recently concludes that manipulative reduction should be the method of choice up to the age of 6 in bilateral cases, and 9 in unilateral cases, and he deprecates a recent tendency in the United States and the Continent to secure replacement of the head by operative means

This manipulative reduction is accomplished in most cases after the method of Lorenz—a method which, save in the hands of the especially skilful manipulator, is attended with a good deal of traumatism to the already deficient hip-Joint region, and is, moreover, fraught with greater dangers. These latter include fracture of the femur and rupture of the femoral vessels or sciatic nerve, but perhaps the greatest and most potential for evil is lost sight of—the separation, partially or completely, of the cartilage covering the femoral head. This, in congenital dislocation of the hip, is only very loosely attached, so that the risk is great, and the separation of this structure readily predisposes to later degenerative and rheumatoid changes

In addition—and here it would appear is the crux of the question—unless the child belongs to the first group, i.e. the actual immediate post-natal disloca-

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accentuated from the point of view of treatment, because in the first group reposition of the head can be observed, radiologically, to be associated with a further phase of development in the deficient acetabulum, and frequently a normal joint results. This redevelopment may occur up to the age of $2-2\frac{1}{2}$, after which it ceases Cases in the second group, which walk late, never come to hospital before the age of $2\frac{1}{2}-3$, and are, therefore, beyond the stage where further development can occur, and something more than mere reduction is necessary if we are to be certain of the retention of the femoral head in the imperfect acetabulum for all time, without any possibility of relapse

The secondary pathology of the untreated or relapsed case needs no reiteration, and for our present study is of relative unimportance. The important lesson of the etiology, therefore, is this. That the affected hip is not a diseased one, but merely a partially developed one, corresponding to a feetal hip of several months earlier, but that placed under suitable environmental conditions, the deficient part exhibits a definite potentiality for further development, that this period of natural reconstruction can be followed radiologically, but ceases somewhere about the age of $2\frac{1}{2}$, and that thereafter the degree of aplasia is permanent, and further changes of a degenerative nature may ensue in the absence of treatment or in the presence of ill-planned or badly-executed treatment

The accepted line of treatment of the condition does not pay sufficient heed to these points, and, naturally, the results of the intervention bear this out adequately I have heard a pædiatrician of large experience state that manual replacement of the femoral head is possible in 60 per cent of cases up to the age of 10, of which at least 25 per cent will recur Furthermore, I have had an opportunity of examining several cases that were recalled 10 to 20 years after treatment, and I formed

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walking well, with good movement, not yet quite free in all directions. A letter of thanks from the mother, received this year, states that no one would know there had ever been anything wrong with her

I have selected these two cases because they illustrate the speed and certainty with which results can be obtained by this method, even in relapsed cases, if sufficient attention is paid to surgical technique and physiological ideal in operating. These are only two of a now numerous series of cases so treated, with complete success, and comparing them in my own mind with the tragic procession treated conservatively by Lorenz manipulation alone, or by other—operative—reduction without reconstruction, I am absolutely convinced of the merit of the new proceeding

The reduction should consist of gentle abduction of the flexed thighs to a little more than a right angle, and then gentle leverage of the head over the posterior acetabular rim by a process of lifting rather than of forcing. If sufficient time is taken, this manœuvre is always successful, even after repeated attempts. The hip, when reduced, is retained in the usual frog position in a plaster of Paris case for three months, during which time the head dilates up any capsular constriction and comes to fit snugly into the deficient acetabulum.

At the end of three months the operative repair is carried out. The joint is approached by an anterior Smith Peterson incision and good exposure is obtained by turning down a flap of the gluteal muscles by means of subperiosteal dissection off the wing of the ilium, thereafter, a narrow slip of bone from the ilium above the acetabulum is turned down to replace the deficient shelf. This is only wide enough to replace the absent rim. It must not be too broad and therefore retentive only, since the arm is to form a joint as physiologically and anatomically perfect as possible. The shelf graft is fixed into position over the femoral head by means

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tions, the case has certainly proceeded too far for further development of the aplastic bony acetabulum to occur In a certain proportion of cases the cotyloid ligament surrounding the acetabular rim may be strong enough or broad enough to retain the head in its socket, but this is a factor which cannot be assessed without actual inspection of the joint

The treatment must be started with three ideals — (1) Reposition of the head, (2) retention of the reduced head, (3) as perfect a joint as is possible at the stage of deformity, as judged from an anatomical and physiological standpoint. While, in the first group, this is possible by mere gentle reduction and fixation in plaster, which allows the acetabulum to complete its development, in the second group, or in unsuccessful cases of the first type, where restitution cannot be hoped for, or fails to occur, reduction by manipulation should be followed at a satisfactory interval by a physiological reconstruction of the joint, with restoration of the acetabular architecture. The results of such a mode of treatment are well illustrated in the following cases —

Case 1—J P, female, et 7 Admitted to hospital in October, 1926, with typical lurching gait and telescopic movement in the right hip. Four years before she had had a double congenital dislocation of the hips treated by manual reduction and plaster Radiological examination showed a relapse on the right side, and on stereoscopic X-ray examination there was a well-marked gutter running up on to the dorsum illu

10 9 26 Hip reduced and plaster case applied 12 11 26 Reconstruction carried out 21 2 27 Fresh plaster applied 11 6 27 Plaster off, massage commenced 4 9 29 Reported, perfect function no limitation of movement or activity X-ray showed a good acetabular shelf—prominent, over-hanging, and well calcified, the patient stands on either leg with ease

Case 2—T E, female, at 8½ Admitted to hospital m June, 1926, with history that she walked late and with a lurch to the left side Examination revealed a dislocation of the right hip joint Radiological examination showed a very deficient acetabular rim with a marked groove running up on to dorsum illi 25 6 26 Reduced and plaster applied 6 9 26 Reconstruction carried out 18 6 27 Walking 13 9 27 Sent home to Ireland,

Editorial Notes.

DR MORRIS FISHBEIN, the author of the opening article in this number of The Practitioner, is not yet so well known on this side of the Atlantic THE FUTURE as he is in America, where he has OF THE PROFESSIONS been described as "the man who rules American medicine with a newspaper " The Journal of the American Medical Association, which he edits, is the most influential medical journal in the New World, with a circulation of over 95,000 copies weekly and a special edition printed in Spanish for the South American profession The American Medical Association is not only a voluntary association like our British Medical Association, but has taken upon itself many of the duties and the powers of our General Medical Council By shutting up scores of inferior medical schools in the past twenty years, it has raised the standard of medical education throughout the United States, and week by week 1t has waged and continues to wage fearless war upon all medical and quasi-medical quackery and corruption In the work of educating the general public to take a sane and healthy view of medical matters, Dr Fishbein has taken a very prominent part, not only in founding and editing Hygera, a health journal published by the American Medical Association for the lay public, but by writing such witty and informing books as "The Medical Follies," "Shattering Health Superstitions," and "Doctors and Specialists"

The symposium of three articles on different aspects of life insurance, by Dr Theodore Thompson, Dr Cecil Bosanquet and Dr Burton-Fanning respectively, published this month, surveys a subject with which most general practitioners and consulting physicians have to deal from time to time. Life insurance examina-

of little bone chips packed in behind it and by an ivory peg driven through it and the chips

If due regard is paid to general surgical procedure, and hæmostasis and undue trauma to muscle avoided, the operation is not attended with any more risk or shock than any other reconstructive operation of child-The aseptic technique must be rigid, and the toilet of the skin meticulously studied before and during the operation The continuous administration of subcutaneous glucose saline with insulin is also of inestimable value in counteracting shock A plaster case is applied at once and retained for three months The position of the legs is then altered from the frog position, to one of abduction to 45 degrees, internal rotation, and hyperextension, and a fresh plaster applied This also is kept on for three months Thereafter the child starts massage and graduated movements till the legs are completely adducted and straight Walking is then commenced, under supervision, in order that little errors may be corrected at the outset In this way exceptionally fine results are obtained

The advantages of this operation and the consequent regime are —(1) Reduction is accomplished with the least possible trauma, and later rheumatoid changes thus guarded against (2) In addition to reduction, the reposed head is secured, not by gross stabilization, but by a refined physiological acetabular rim, approximating to the normal, and later relapse is prevented

The tragedy of crippled childhood is a sufficient stimulus for us to seek out the best in the way of attempted alleviation of its burden It is my submission that the achievement of success in congenital dislocation of the hip is along the lines of physiological operative restoration of the normal acetabular architecture

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DR MORRIS FISHBEIN, the author of the opening article in this number of The Practitioner, is not yet so well known on this side of the Atlantic THE FUTURE as he is in America, where he has OF THE PROFESSIONS been described as "the man who rules American medicine with a newspaper " The Journal of the American Medical Association, which he edits, is the most influential medical journal in the New World, with a circulation of over 95,000 copies weekly and a special edition printed in Spanish for the South American profession The American Medical Association is not only a voluntary association like our British Medical Association, but has taken upon itself many of the duties and the powers of our General Medical Council By shutting up scores of inferior medical schools in the past twenty years, it has raised the standard of medical education throughout the United States, and week by week it has waged and continues to wage fearless war upon all medical and quasi-medical quackery and corruption In the work of educating the general public to take a sane and healthy view of medical matters, Dr Fishbein has taken a very prominent part, not only in founding and editing Hygera, a health journal published by the American Medical Association for the lay public, but by writing such witty and informing books as "The Medical Follies," "Shattering Health Superstitions," and "Doctors and Specialists"

The symposium of three articles on different aspects of life insurance, by Dr Theodore Thompson, Dr Cecil Bosanquet and Dr Burton-Fanning respectively, published this month, surveys a subject with which most general practitioners and consulting physicians have to deal from time to time. Life insurance examina-

tion requires a modern review such as this, for many venerable rules for the assessment of lives which used to be followed are now being discarded as erroneous The importance attached to the arterial blood-pressure is stressed nowadays by most insurance companies, and on this point both Dr Theodore Thompson and Dr Bosanquet have some interesting remarks to make While Dr Thompson agrees that the measurement of the systolic pressure has been of the greatest value in life insurance examination, he considers that the recording of the diastolic pressure on life insurance forms is superfluous and misleading, in the first place because the exact point where the diastolic pressure is read off varies in America and in England, but also because this point is often ill-defined and many practitioners have difficulty in determining it accurately Low blood-pressure may be compatible with perfect health, but it is also found in tuberculosis, anæmia and where a septic focus is present Dr Bosanquet observes that occasionally the blood-pressure may vary upwards and downwards within a very few minutes, and that a doubtful case should have the opportunity of being re-examined after an interval of time Other factors besides the blood-pressure, such as the condition of the arteries, the heart and the kidneys, must be taken into consideration in assessing the hyperpietic applicant for life insurance Dr Burton-Fanning points out that next to a history of tuberculosis, excessive weight of the proposer is the most common reason for the imposition of an extra premium, and it is interesting to note that the statistics which he analyses indicate that this rating-up justifies itself more constantly than any other, cardio-vascular diseases accounting for the largest number of deaths in this group

Letter to the Editor.

RESEARCH DEFENCE SOCIETY

September 13, 1930

DEAR SIR,

I WISH I could persuade more members of the medical profession to be subscribers to the Research Defence Society

We do not need any large sum, but if we could get two hundred more annual subscribers of £1, it would make our work easier to carry on We are the only society that exists to expose the mis-statements of the anti-vivisection societies and agitators They preach that all experiments on animals are useless, that no good has come from them to man or beast, and that the experiments are grossly cruel

An uninformed public accept such statements as true, and the only way to get the facts known is by the propaganda of a society such as ours. But this is expensive—and so I ask the help of those who wish it well

Yours faithfully,

KNUTSFORD

Chairman,

Research Defence Society,

11, Chandos Street,

Cavendish Square,

London, W 1

Practical Notes.

The Effect of Single Massive Doses of Liver Extract on Patients with Pernicious Anamia

M C Riddle and C C Sturgis have observed the effect of single large doses of liver extract in a series of cases of pernicious anæmia, and their experience confirms the opinion expressed by Minot, that the response to liver medication depends rather on the total amount of the active liver principle used during a certain period of time rather than on the amount consumed each day effect is obtained from the thirty vials of liver extract given in a single dose or in ten doses of three vials each at daily intervals The active liver principle seems to be utilized in a quantitative fashion, the effect of a given amount lasting a given time, the minimum daily amount sufficient for a satisfactory response being that present in three vials of liver extract (approximately equivalent to half a pound of liver) The magnitude of the reticulocyte response does not appear to be influenced by the presence within the body of an excessive amount of the active liver principle, a certain maximum number of reticulocytes being possible in any case, the number being related to the original blood level The rate of the reticulocyte response appears to be accelerated to a certain extent by the dosage of the liver extract, the response occuring most rapidly when a large, single dose or large daily doses of liver extract are given When the reticulocyte response develops at a maximum rate, as it apparently does after the administration of a single dose of thirty vials of liver extract, reticulocytes begin to increase in numbers and percentage about forty-eight hours after the giving of the liver extract A maximum number and percentage of reticulocytes appears between one hundred and four and one hundred and forty hours after the administration of liver extract and the reticulocyte response ends within two hundred and forty That the administration of a single dose of thirty vials of liver extract has an intensely stimulating effect upon the hæmatopoietic tissues of the bone marrow is indicated by the presence of numerous nucleated red blood cells and immature white blood cells of myeloid origin in the blood during the first two or three days after the liver extract is given. The immediate clinical effects, reticulocyte response and increase in the red blood count and the amount of hæmoglobin in the blood are as satisfactory after a single dose of thirty vials of liver extract as when three vials doses are given daily for ten days. The effect of a single dose of thirty vials lasts approximately ten days -(American Journal of the Medical Sciences, vol clxxx, no 700, July, 1930, 1)

Simple Achlorhydric Anæmia

Under this title L J Witts has collected the somewhat scattered information and analysed fifty cases of this form of anæmia which was described by Knud Faber of Copenhagen in 1913, and called cryptogenic achylic chloranæmia by Kaznelson

in 1926 It is not uncommon in middle-aged women and occasionally is seen in males. The cardinal feature is absence of free hydrochloric acid from the gastric juice, the anæmia is microcytic, with a low colour index, in fact of the chlorotic type Reticulocytes are within the normal number There is not any evidence of hæmolysis, and the leucocytis are normal The bone marrow is hyperplastic, due to increase of the erythroblastic tissue, and the spleen may show a pure hypertrophy tongue and koilonychia or a spoon-shaped depression of the fingernails may be present The condition is closely related to the Plummer-Vinson syndrome or the association of dysphagia and It rarely passes into Addisonian anæmia, but they are regarded as manifestations of two different ways in which the bone marrow reacts to the same influence or toxin-one being a secondary anæmia, the other a megalocytic anæmia, this same tendency is seen in the anæmia of childhood, pregnancy, sprue, pellagra, hypothyroidism, and intestinal stenosis The treatment is blood transfusion, or iron in sufficient doses, which is the only drug of any value, liver and hydrochloric acid have not any effect on the anemia Continuous treatment is necessary to prevent relapse — (Guy's Hospital Reports, 1930, July, 253—296)

Pyuria in Infancy and Childhood

Mary Griffin, of the Research Department, Royal Hospital for Sick Children, Glasgow, records some interesting observations on pyuria Among sixty cases, examined bacteriologically, various members of the Bacillus coli group were found alone in 38, streptococci alone in seven, and both coliform organisms and streptococci in 15 cases cases the patient's serum was tested for agglutinating antibodies against the organism isolated from the urine, and in eight instances agglutination occurred, the patients whose serum in high dilution agglutinated the infecting organism were generally acutely ill, whereas those patients whose serum did not agglutinate the micro-organisms found in the urine had less severe clinical symptoms The agglutinines which disappear when the infection subsides, chiefly appear when there is definite renal damage The post-mortem records of the hospital for fifteen years contained 160 cases 113 in females, 100 being within the first two years of life, and 47 in males, 43 within the first two years of life The infection of the kidneys was bilateral in 118, in the left kidney in 27, and in the right kidney in 15, there was definite cystitis in 70 cases In these fatal cases the pyuria was generally due to a pyelonephritis rather than to a simple pyelitis In the majority of cases the evidence pointed to a blood-borne infection, for the urmary bladder and renal pelves were usually much less severely affected than the kidney substance, which showed cellular reaction chiefly in the cortex with microorganisms in the glomeruli and blood-vessels -(Glasgow Medical Journal, 1930, vol civ, 21)

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PRACTICAL NOTES

moderate increase in the number of red blood corpuscles was found to be not uncommon, it was ascribed to irritation of the bone-marrow by the irradiations. Lavedan insists that there is a well-marked difference in the susceptibility of individuals to the effect of irradiations, and that it is quite possible by adequate protection to prevent the occurrence of these changes in the blood—(Archives de l'Institut de l'Université de Paris et de la Fondation Curie, 1930, vol. 1, fascicule iv, 477-584)

The Control of Cheyne-Stokes Respiration by Histamine

F Kisch has investigated the effect of histamine on the distressing respiratory condition known as "Cheyne-Stokes breathing," which frequently occurs in cases of advanced aortic disease and is notoriously difficult to relieve Experimental work indicated that very small doses of histamine after causing slight dilatation of the peripheral blood vessels produce a rise in the amount of blood in the systemic circulation by increasing the output per minute of blood by the heart. In this way extra blood becomes available for the cerebral circulation, with subsequent relief to the respiratory centres in the medulla, to a temporary disturbance of which Cheyne-Stokes breathing is due Clinical evidence is brought forward to support this view of the action of histamine Nine cases of advanced aortic disease with well-established Cheyne-Stokes breathing were given small doses of histamine subcutaneously Within twenty to thirty minutes normal breathing was resumed and was continued for about six Next day two injections of histamine were given in addition to the usual treatment by digitalis Cheyne-Stokes breathing ceased from this time on, but for what period is not Ill-effects of the injections are slight and transient They consist of slight headache with a feeling of warmth and an occasional reddening of the skin of the arms and neck These symptoms pass off within an hour - (Klinische Wochenschnft, September 27, 1930, 1819)

Dental Infections and Their Treatment

R H McKeag makes a plea for closer co-operation between the medical and dental professions. The dentist, in his effort to solve the problems of dental disease, should have the whole-hearted assistance not only of the bacteriologist, pathologist and radiologist but also of the general practitioner. No mouth can be considered free from a focus of infection if it contains a dead tooth, a root or unerupted tooth, or an area of bone containing residual sepsis. To ascertain whether any of these is present an X-ray photograph is necessary, but the most easily observed lesions are not necessarily the most dangerous. The correction of an acidosis or even a tendency towards an acidosis may be of considerable value in preventing dental decay—(Bristol Medico-Chirurgical Journal, vol. xlvii, no. 176, 1930, 143.)

Cysts of Long Bones of the Hand and Foot and Their Treatment

H Platt analyses an interesting series of 20 cysts of the long bones of the hand and foot, occurring in 17 patients The bones involved in order of frequency are the phalanges of the hands. metacarpals, and more rarely, the metatarsals The cysts originate in the growing ends (metaphyses) The favourite digit is the little The majority of cysts develop insidiously, remain latent for a time, and are discovered after the occurrence of local injury Spontaneous fracture is a fairly common phenomenon cysts in which a microscopic examination was made of material removed at operation, two varieties of lesion were distinguished (a) chondroma (myxochondroma), (b) osteitis fibrosa For practical purposes these two lesions comprise the whole morbid histology of the miniature bone cysts Alternative lesions, such as grant-cell tumour (myeloid sarcoma) or malignant tumours, are almost unknown `The differential diagnosis between the two standard lesions is usually impossible on clinical and radiographic evidence alone In both types of cyst spontaneous arrest or healing may occur, particularly in young patients. For such cysts no form of operative treatment is required. Cysts which are actively extending, or where the bone shell is perforated by fracture, should be explored The most effective method of eradicating the lesion is to curette the contents and cauterize the interior of the cyst with pure carbolic acid This procedure is best combined with the insertion of one or more autogenous bone-grafts, which hasten the obliteration of the cystic area — (British Journal of Surgery, vol xviii, no 69, July, 1930, 20)

The Blood of Radiologists

J Lavedan, of the Radium Institute of the University of Paris, has published an exhaustive article on the effects of irradiations on the blood of those working with X-rays and radium article is divided into two parts. In the first he summarizes the existing literature, including the results obtained by Pfahler in 1922 from a questionnaire sent to a thousand American radiologists The consensus of opinion is that there is a diminution in the total number of white blood corpuscles with a relative fall in the percentage of the polymorphonuclears The second part of his article records the experience of the Paris Radium Institute, where since 1921 the blood of the workers has been The characteristic regularly examined every three months change is an increase in the mononuclear cells, sometimes relative with a lowered total white count, sometimes real with a normal or increased leucocyte count It may be so well marked as to approach an inversion of the relative polymorphonuclear and lymphocyte percentages This change may take place rapidly, but it is not regarded as a pre- or sub-leukæmic state, and does not dispose to infection, its causation is left unsettled In some cases the number of eosinophil cells is increased, and a

REVIEWS OF BOOKS

the book, purely from the practical standpoint, with illustrative cases. Another addition is a chapter on examination for life assurance, which should prove of real value to those who are not experienced in such examinations. The chapters on clinical examination have been amplified in order to bring them into line with the most recent advances in cardiology. There can be no doubt that, with these welcome additions, this useful little book will enjoy an increasing popularity amongst students and young practitioners.

Disease and the Man By George Draper, M.D., Associate Professor of Clinical Medicine, Columbia University, New York The Anglo-French Library of Medical and Biological Science London Kegan Paul, Trench, Trubner & Co, Ltd. 1930 Small demy 8vo, pp. xix and 270 Illustrations 45 Price 12s 6d

This important work is a continuation of the author's well-known book, "Human Constitution" (1924), which established by much intensive investigation, at his Constitution Clinic in the Presbyterian Hospital, New York, the various physical characters which dispose men and women to particular diseases. In this volume the general principles underlying the author's conception and investigations into the relations between constitution and disease are stated afresh, and a full account is given of fresh lines of work, especially investigation of the psychological panel of patients, a much more difficult task than that of analysing the more tangible physical characteristics. There is much that is new and thought-stimulating in this volume on an aspect of medicine which must surely be widely developed in the future

Exercise Its Functions, Varieties and Applications By Adolphe Abrahams, M.D., M.R.C.P. London William Heinemann (Medical Books), Ltd., 1930 Pp. viii and 92 Price 3s. 6d

This is a popular and brightly written account of the different

The Hair Its Care, Diseases, and Treatment By W J

O'Donovan, O B E, M D, M R C P, Physician to the Skin

Department, London Hospital London J and A

Churchill 1930 Pp x and 218 Illustrations 40 Price

There are few books devoted solely to diseases of the hair, and when one containing so many personal touches and so much evidence of experience as this appears, success should be certain Beginning with an account of the arrangement of the human hair, this work goes on to describe ectodermal defects which may be major in which the skin, sweat glands, teeth and nails are all gravely affected, or may be minor. The rare condition of monilethrix or beaded hair is fully described, and then the development of the hair and abnormalities of development are reviewed Alopecia naturally receives much attention, and an attractive chapter is devoted to hair dyes and dye dermatitis, much infor-

mation is given about the composition of hair dyes, the least harmful of which is henna, but the only colour it imparts is red Lead acetate has for years been the chief ingredient of many commercial hair dyes, but may cause dangerous poisoning. In the last chapter on pseudo-alopecia attention is called to epidemics which are ascribed not to infection but to suggestion and local scratching. While containing much personal knowledge this pleasantly written book gives ample references to the observations of others.

emanating from this Tamous hospital Although Strention is rightly directed chiefly to the commoner diseases, others are by no means neglected, thus there is a good description of erythrædema polyneuritis or pink disease on which the author has written elsewhere, the features of acute or subacute atrophy of the liver, and of cardiospasm are portrayed, though no mention of achalazia is made in connection with the latter condition. The illustrations are instructive, and among them reference may be made to radiograms of the stomach of a normal infant after a bottle feed, supporting the statement that air-swallowing is physiological in every breast- or bottle-fed infant, and that after a feed every infant should be held up for fifteen to twenty minutes until the wind is broken or cructated twice, so as to ensure undisturbed sleep. The directions as to treatment are full, an appendix gives appropriate doses of the more useful drugs at various ages, and the index is admirable

The Clinical Interpretation of Aids to Diagnosis, Vol I London The Lancet, Ltd 1930 Pp vii and 380 Figs 49 Price 10s 6d

This collection of forty-four articles, published during the last two years in the pages of the Lancet by thirty contributors, forms an extremely useful guide to the practitioner and covers a wide The articles, which are each prefaced by a short summary of their contents and provided with a blank page for the reader's memoranda, are written by authorities on the various methods of investigation, thus Sir G Lenthal Cheatle discusses in a wellillustrated contribution the interpretation of the histological changes in the mammary gland, and Mr T G Stevens the conclusions to be drawn from material curetted from the uterus, Dr J H Anderson, of Ruthin Castle, writes on cholecystography with wise reserve, pointing out that it is a good servant but may prove a bad master, Mr J B Macalpine describes the inferences to be drawn from pyelograms, and Dr Crichton Bramwell points out what electrocardiograms can tell the observer Most of the articles deal with the examination of the blood, the urine, and fæces, in the account of the Widal or agglutination reaction in the diagnosis of infection due to the enteric group of microorganisms Dr A B Rosher draws attention to the O and H antigens of typhoid and paratyphoid bacilli, the O antigen appearing only as a result of infection, so that a diagnosis can be made

REVIEWS OF BOOKS

the book, purely from the practical standpoint, with illustrative cases. Another addition is a chapter on examination for life assurance, which should prove of real value to those who are not experienced in such examinations. The chapters on clinical examination have been amplified in order to bring them into line with the most recent advances in cardiology. There can be no doubt that, with these welcome additions, this useful little book will enjoy an increasing popularity amongst students and young practitioners.

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The Diagnosis and Treatment of Heart Disease Practical Points for Students and Practitioners By E M Brockbank, M D, FRCP Sixth edition London H K Lewis and Co, Ltd, 1980 Pp xiv and 240 Illustrations 35, including 3 plates Price 7s 6d

THE SIXth edition of Dr Brockbank's well-known manual includes two important additions chapters on angina pectoris and on aneurysm These are written, in accordance with the rest of



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tion The operator should see that all air is ejected from the cannula tube. This ingenious apparatus is easily transported and manipulated, and the contained solution is secure from contamination.

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Messrs Siemens have sent us their latest lamp catalogue (No 350) for 1930 31, showing reduced prices. The catalogue covers a comprehensive range of electric lamps, including standard lighting lamps, gas-filled, vacuum and carbon filament lamps, projector lamps, automobile and battery lamps, flash lamps of all kinds, miners' lamps, sign lamps of all kinds and neon lamps, and decorative lamps suitable for parties, ballrooms and Christmas trees, which do away with any possibility of fire and other dangers inherent in the use of Chinese lanterns or candles

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APPOINTMENTS.

No charge is made for the insertion of these notices the necessary details should be sent before the 14th of each month to The Editor, THE PRACTITIONER, 6-8, Bouverle Street, Fleet Street, E C 4, to secure inclusion

- ALLISON, R S, MD Belf., MR C.P Lond., Assistant Physician to the Royal Victoria Hospital, Belfast
- ALSTEAD, S, LR C.P Lond, M R C S, nppointed Junior Medical Officer, Little Bromwich Fever Hospital, Birmingham
- CHAMBERLAIN, DIGBY, FRCS Eng., appointed Honorary Visiting Surgeon, Dewsbury Infirmary
- CRAWFORD, A MUIR, M D Glasg., FRFPSG, appointed Physician in charge of Wards, Royal Infirmary, Glasgow
- DOHERTY, D, L,RCP, LRCS Edln, LRFPS.Glasg, appointed Temporary Assistant Medical Officer of Health, Donegal
- DOWNER, HAROLD, MB Ch B., DL O., appointed Honorary Assistant Surgeon to the Ear and Throat Department, Worthing Hospital
- FLEMING, G B, M D., B Chir Gamb., appointed to the Samson Gemmell Chair of Medical Predictics in councion with the Royal Hospital for Sick Children, Glasgow
- FLEMING, G W, LRCP, LRCS Edin, DPH appointed Medical Officer of Health and School Medical Officer for Gesport
- FRASER, A, MD., Ch B Glasg., DPH, appointed Medical Officer of Health for the Stewartry of Kirkcudbright.
- GLYN, PHILIP E., MRCS, appointed Casualty Officer to The Beckett Hospital Dispensary, Barnsley, Yorks
- GOUGH, W., M.B., BS Lond, FRCS., Eng., appointed Honorary Gynaecologist, Leeds General Infirmary
- HABGOOD, G., MB, ChB Camb., appointed Certifying Factory Surgeon for the Totton District, Southampton
- HATRICK, J. C., M. B., B. S., appointed Senior Resident Medical Officer Queen Charlotte & Maternity Hospital, Marylebone Road, N. W.
- HAULTAIN, W F T, MB, BChir, Camb, FRCS, Edin., appointed Assistant Physician Edinburgh Royal Maternity and Simpson Memorial Hospital.
- HUTTON-ATTENBOROUGH, E. A., M. B., B. B. Lond., appointed Medical Referee under the Workmen a Compensation Act for County Court Circuit, Ao 20

- JAMIESON, E, MB., ChB Glasg., appointed Junior Lady Resident, Edin burgh Royal Maternity and Simpson Memorial Hospital
 - JOHNS, A. WALLACE, LRC.P., Lond., MR C.S.. appointed Assistant Resident Medical Officer City of London Maternity Hospital, City Road
- KELLY, W., MB Ch B.Aberd., appointed Certifying Factory Surgeon for the Basingstoke District, Southampton
- KENNEDY, C D, MB, Ch B Edin, FR C.S Edin, appointed Assistant Physician Edinburgh Royal Maternity and Simpson Memorial Hospital
- LEWIS, IVOR. M D Lond, DPH., appointed Medical Officer of Health for Plymouth and Superintendent of the City Hospital.
- MARSHALL, J. H., M. B., Ch. B. Birm., appointed Certifying Factory Surgeon for the Pontesbury District, Salop
- McLAREN, M B, MB., Ch B.Edin., appointed Senior Lady Resident Edinburgh Royal Maternity and Simpson Memorial Hospital.
- MILLER, D, MD, FRCS Edln, appointed Physician, Edinburgh Royal Maternity and Simpson Memorial Hospital
- MOIR, P J, MC., FRCS Eng., appointed Honorary Visiting Surgeon, Dewsbury Infirmary
- NIXON, W C W., FRCS Eng., appointed Assistant Resident Medical Officer, Queen Charlotte's Maternity Hos pital, Varylebone Road, N W
- O'LEARY, MARY, LRC.P., Lond., MRC.S., DPH, appointed Distract Resident Medical Officer, Queen Charlotte's Maternity Hospital, Marylebone Road NW
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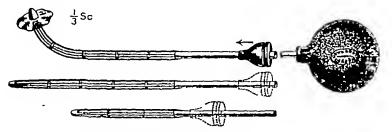
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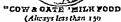
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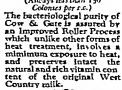


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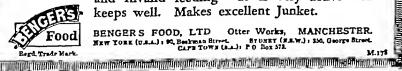
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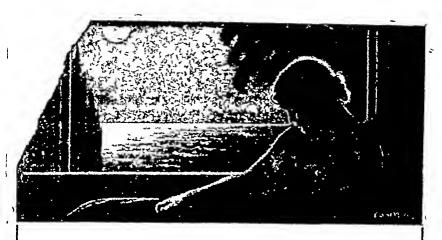


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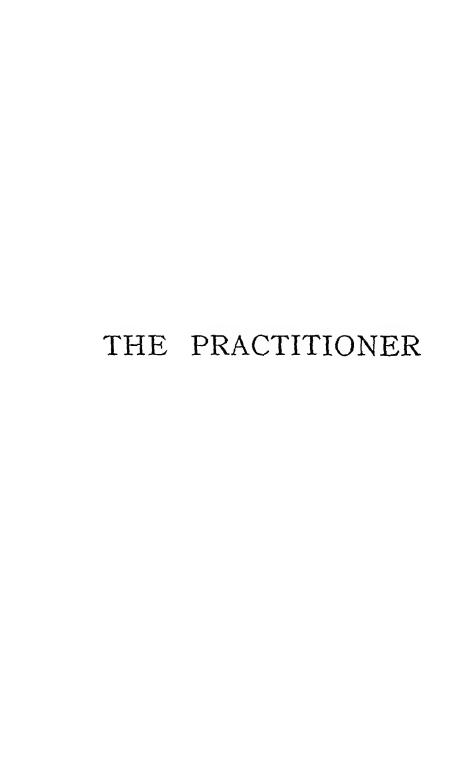
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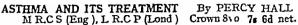
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\(\text{MgO} \) 0 65%

\(\text{P2O}_3 \) 2 70%

\(\text{k_2O}, \text{Na_2O} \) 1 04%

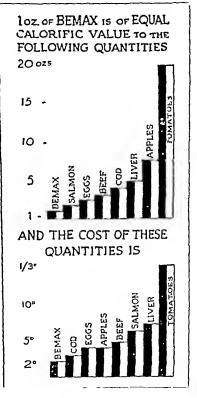
\(\text{Fe_2O_1} \) Trace

\(\text{Total Ash} \) 4 51%

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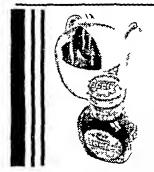
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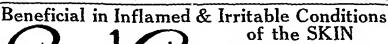
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he orneves to be entrained in It seems highly probable that these substances are the pressor substances such as epinephrine, which are developed by putrefactive bacteria in the intestine developed by putrelactive bacteria in the intestine.

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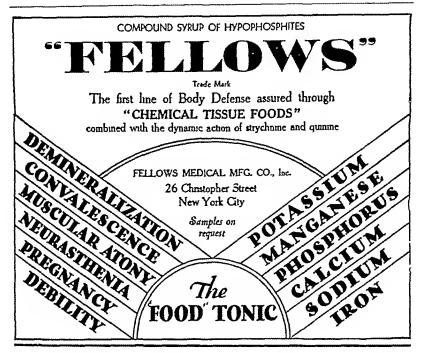
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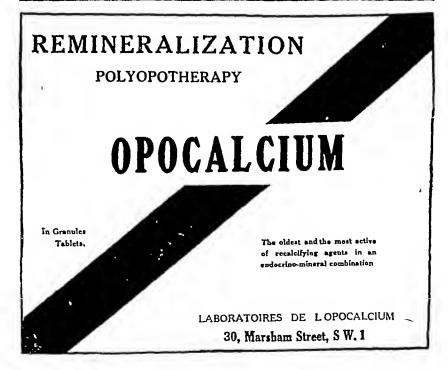
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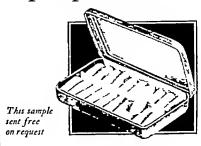


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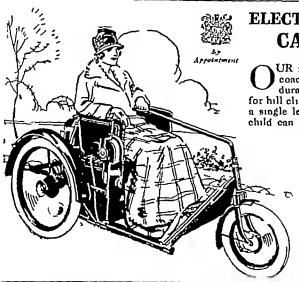
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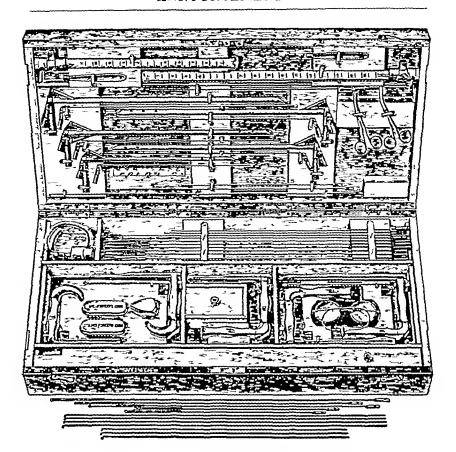
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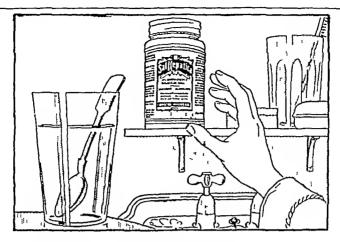
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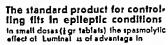


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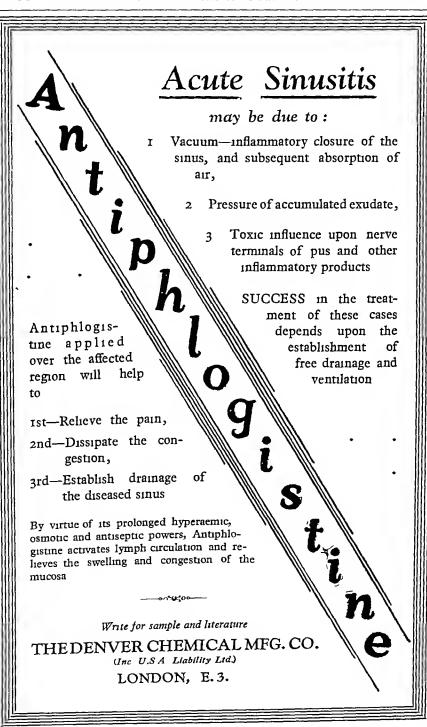


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A letter recently received

The Medical Adviser of Messrs Kaylene Ltd, London

Dear Sir,

The case to which I referred was a child of six months who was brought to me after having treatment elsewhere for diarrhoa and vomiting. The child was practically a skeleton and apparently had been vomiting everything—even medicines—for many days. The mother thought, and her friends thought, the child was dying, and I happened to be the nearest doctor. I gave the child one teaspoonful of plain Kaylene in plain, cold, boiled water, and kept the mother and child in my consulting room to watch effects. If ever a child was drawn from the jaws of death, I think that little sufferer was. The Kaylene was retained, the gasping steadily lessened, the haunting look of that child's eyes became less distressing, in fact, the change for the better was so pronounced that in an hour's time I allowed the mother to take the child home

Fortunately, I had sufficient Kaylene by me (a sample you kindly sent), and I gave the mother sufficient to give a teaspoonful every hour during the night. The chemists' shops were all shut by this time. I gave full instructions—strict instructions—not to give anything else but Kaylene and plain, cold, boiled water, as I had done.

In the morning the mother came to see me and informed me that only twice during the night the child had loose stools but no vomiting, and had slept fairly well. The child had other two loose motions during the day, but not offensive ones like all the other stools. In the evening the child cried—the first time for two days—and as she looked, and was, so much better, I gave her some white of egg with plain, cold, boiled water. Still improving, I kept her on this for three days. She was doing well and I then allowed her milk. She made a complete recovery, and there can be no doubt whatever that Kaylene saved the child's life.

Yours faithfully,

M.B, CM

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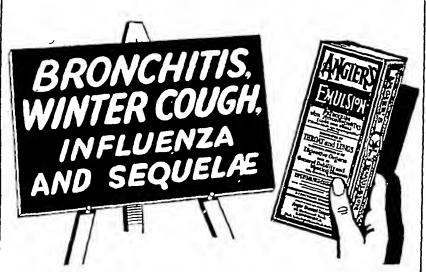
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DECEMBER

1930

Thyroidectomy: Its Indications and End-Results.

BY G W CRILE, M.D

Director, Cleveland Clinical Foundation, Cleveland, Ohio, U S.A

HIS report is the result of a study of the case histories and follow-up data in a series of 20,992 operations performed by my associates and myself on the thyroid gland. Of these operations, 17,120 have been for hyperthyroidism, 3,684 for quiescent goitre and 188 for cancer

Laboratory researches bearing on different phases of the problems presented by patients with diseases of the thyroid gland have gone hand in hand with the clinical work. For ten years our statistical department has been continuously at work following up our patients and tabulating our data. As far as possible, and in the majority of cases, this follow-up has been based on personal interviews and examinations. Often our ideas have been changed as the result of this accumulating information. We are well aware that final and absolute truth is not attainable, but "working" truth is attainable.

Let us first clear the ground by a consideration of the cases in which operation has failed to relieve the symptoms completely or even partially

UNFAVOURABLE RESULTS

Cases in which the symptoms have simulated those 661



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THYROIDECTOMY

delirium

Senility and hyperthyroidism —Occasionally we see patients so old and with such a degree of cerebral sclerosis that for the most part they are free from delirium, although transient delirium occurs at night and occasionally in the daytime. In our earlier experience we submitted such patients to thyroidectomy. Our end-results soon showed that these patients are too near the borderline for the hazard to be taken with safety. We now hold strictly to the rule that unless a senile patient is sane all the time, thyroidectomy is unsafe. In such cases, however, we have had brilliant results after a struggle of a month or more, during which the mind has become continuously clear. In some cases operation has given a fine lease of life and activity

Cardiac lesions—In our earlier series, it occasionally happened that cases in which a cardiac lesion with nervousness, tachycardia, sweating, and an increased metabolic rate, was associated with an adenoma, slipped through our diagnostic mesh. In these cases the operation was ineffective

Technical errors —To the unfavourable results due to the causes listed above must be added those which result from technical errors, among which is bilateral adductor paralysis. In cases in which this unfortunate sequel has occurred, a special tube adapted by Dr. J. M. Waugh has done much to remedy the unhappy condition. This tube has a valve which permits the intake, but shuts off the egress of air through the tube, thus allowing free breathing, but giving the patient a useful voice. Dr. W. V. Mullin has pursued a painstaking research to discover the possibilities of repair of the nerves, but without success.

The occurrence of post-operative tetany is another consequence of a technical error Happily, this occurrence, too, is rare, for the glands can either be preserved or, if they have been removed, they can be

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of hyperthyroidism —These have included cases in which neuro-circulatory asthenia, effort syndrome, etc, have been associated with goitre and in which symptoms of hyperthyroidism have been present. In most instances there has been a moderate increase in the basal metabolic rate, which usually has ranged from plus 15 to plus 25. In most of these cases the course of the disease has continued unchanged and the operation has been useless. To be sure, the underlying condition has not been made worse by the operation, but the patients in this group have been justly dissatisfied. Some patients have been greatly benefited, however, and a study of their cases makes it appear that improvement is most apt to occur when the result of the adrenaline-sensitization test is positive.

Operations in the presence of delirium—Operations for acute hyperthyroidism have been unsuccessful in cases in which prolonged hospitalization and treatment have failed to bring the patients out of their delirium into a conscious state, and in which it has seemed obvious that death was approaching Either the end was accelerated or the patient recovered physically from the operation, while the mentality remained permanently submerged Patients in the latter group were more unfortunate than those in the former Happily, there has been only a small group of such cases in our total series, for since we became aware of this unhappy outcome, we have not operated upon the persistently delirious patients Although operation is not advised in the presence of persistent delirium, in cases of temporary, slight delirium in younger subjects, the patients have been cured by a cautious approach through ligation on one side, then on the other side, a period of rest at home for three months, and a return to the hospital for the thyroidectomy Surprisingly good results may follow such carefully graded operative procedures in selected cases of intermittent

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THYROIDECTOMY

plus 25), tachycardia, nervousnesss, tremor, fatigue, sweating, etc. In fifteen of these cases of residual hyperthyroidism we attacked the adrenal gland some, unilateral adrenalectomy was performed, in others, a bilateral denervation of both adrenals in two seances The patients on whom these procedures were performed were all definitely cured In several of these cases, active hyperthyroidism was present at the time of the operation As soon as the adrenal was excised or the nerves divided, the tachycardia began to come under control, and the pulse pressure, hyperhidrosis, and nervousness rapidly decreased One unexpected observation was made, namely, that the entire side of the body, including the arm and leg, on which the adrenalectomy or denervation was done became warmer and drier than the other side It is now five years since the first of these operations was performed, and the patient is serenely quiescent at present

Hypothyroidism —Hypothyroidism presents many clinical surprises, whether it occurs spontaneously or results from the removal of too much of the thyroid gland. There are two points worth mentioning in regard to its treatment. The first is that by feeding thyroid extract in a dosage which is constantly checked by estimations of the basal metabolism, the sluggish, inactive thyroid can be made to grow through what seems to be a process of excitation. This must be done only under careful supervision, or hyperthyroidism may be produced. The second point is that in hypothyroidism there is low gastric motility and low acidity or anacidity, so that coincident with the administration of thyroid extract dilute hydrochloric acid should be given

RELATION OF BASAL METABOLISM TO END-RESULTS

It is a well-founded generalization that improvement following operation bears a direct relation to the meta-

found by a search of the thyroid immediately after its excision, and can be replaced in the following manner. The parathyroid alone is not freed and transplanted, but a unit consisting of parathyroid and thyroid tissue, with their relation undisturbed, is transplanted into one of the exposed muscles just under the fascia. The results of this procedure are excellent. Even in old cases, the implantation of such a transferred unit of thyroid tissue with the parathyroids up to this date controls tetany.

Post-operative hypo- or hyperthyroidism—Extending experience and a continuous check-up on the part of the surgeon are the only means whereby to correct errors as to the amount of thyroid tissue that should be left. Even so, there will be some surprises. For example, as first observed by the elder Kocher, it occasionally happens in the case of a patient with a large nodular goitre that after the removal of the greater part of the thyroid, the subnormal basalmetabolic rate, instead of being lowered still further, may rise to normal. The mechanism of this unexpected result is not clear.

Recurrent hyperthyroidism —When there is a recurrence of hyperthyroidism, we have found that the one and only way to overcome it is to re-operate, unless the surgeon knows that he has removed enough of the gland in the first instance. In this case, it is certain that the recurrence is caused by focal infection somewhere in the body, or that the patient is being subjected to social maladjustments, worry, overwork, or some other strain not disclosed by the clinical investigations. In a small group of cases, recurrence may develop even after reoperation and after adverse influences have been removed. These cases have certain characteristics, among which are the maintenance of weight (that is, loss of weight is not notable and there may be even a gain), an increased metabolism (to from plus 15 to

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THYROIDECTOMY

ease and safety of the operation, we advise the removal of this type of adenoma

Treatment of adenomata—In a review of a series of 3,172 cases of thyroidectomy for adenoma, not a single case has been found in which carcinoma of the thyroid developed later. There is an added reason, however, for the removal of these adenomata, namely, that a certain per cent of them affect the heart, causing the so-called "goitre heart," with the development of a low grade of hyperthyroidism. The clinical results of the excision of the adenomata are clear

Intrathoracic gostre -The cases in which the removal of a large goitre is required for cosmetic reasons, or because of pressure on the trachea, need no comment But there is one variant among the mactive goitres that is not accompanied by any visible deformity, I refer to the goitre that has descended into the thorax, where it compresses the great vascular trunks and displaces the thoracic contents, even the heart goitres may be removed without incident and with safety if the following simple rules are observed The patient should not be given a general anæsthetic the first step, the attachment of the goitre to the larynx and trachea should be completely divided and every vessel tied, leaving a clear anatomical field. The next step is to enter bloodlessly into the exact line of cleavage of the capsule of the adenoma, and the third step is to ascertain whether or not the thoracic outlet allows space enough for the passage of the goitre If there is sufficient space, then by finesse and by the intermittent intrathoracic pressure the goitre may be induced to come out without the use of force, certainly without any force from the side or from below finesse should be in miniature that of a normal delivery by a skilful obstetrician One point is certain, the delivery should be teasingly slow to avoid tearing of the large vascular trunks of the lower pole Such an

bolic rate The higher the rate and the more profoundly the patient is affected, the greater the benefit, both objectively, that is, when considered in relation to the relief of symptoms, and subjectively, that is, when considered in relation to the opinion of the patient But hyperthyroidism is a versatile disease We have had some excellent results in cases in which the operation was performed on patients whose basal rate was normal, although they exhibited the usual symptoms of hyperthyroidism. We are coming to believe that in these exceptional cases the adrenalin test usually gives a positive result

As to the conditions under which a metabolic estimation should be made, it is almost a necessity, when seeking to determine the presence of hyperthyroidism, to hospitalize the patient at least over night and have the estimation made in the morning without moving the patient from bed. In a case of hypothyroidism or myxedema, it does not seem to matter, as the disease itself makes the patient excessively stabilized and dull, hence the ambulatory metabolic rate differs but little from the resting rate

MALIGNANCY

Among 85 operations for cancer of the thyroid which have been followed by X-ray therapy administered by Dr U V Portmann, 45 cases were treated prior to August, 1927 Among these 45 cases, there have been 12 five-year cures and 19 three-year cures —26 6 and 42 2 per cent respectively Malignancy is present in one to two per cent of all goitres removed, and Dr Allen Graham, who has made extensive studies on the pathology of the thyroid, places the incidence of carcinoma in adenomata at from two to four per cent Ninety-five per cent of all cancers of the thyroid occur in discrete, well-defined adenomata On the basis of potential malignancy, therefore, and because of the

THYROIDECTOMY

thyroidectomy

Diabetes —In a study of 449 cases of functional or frank diabetes associated with hyperthyroidism, Dr H J John has found that the sugar tolerance has been increased after thyroidectomy and that frequently the glycosuria has disappeared

Extreme nervousness —In advanced cases, especially those of long standing, in which extreme nervousness is manifested, the nerve balance may not be completely restored after operation. In such cases the patient has a diminished reserve upon which to draw when compelled to meet trying situations

Gastro-intestinal disturbances—We have already referred to the low gastric motility and low acidity which is present in cases of hypothyroidism. That opposite conditions prevail in hyperthyroidism is shown by both clinical and experimental evidence. The resultant diarrhea and other evidences of hyperactivity of the gastro-intestinal tract disappear after operation

PLAN OF OPERATIVE MANAGEMENT

It may be well to add here a brief description of our

plan of management of patients with hyperthyroidism. This plan includes the following essential factors (1) Restoration of the water equilibrium by subcutaneous infusions of from 2,000 to 4,000 c cm of a one-third per cent procaine solution, according to Bartlett's method, given daily before operation (2) Digitalization of the failing myocardium (3) Increase of the blood volume—the oxygen carriers—by blood transfusion (4) Modification and control of the ceaseless, exhausting restlessness and tension—physical and mental — by sedatives and regulation of the environment (5) Administration of Lugol's solution for a period usually of ten days (6) Operation in the patient's room under local anæsthesia and

operation is either extraordinarily easy or becomes suddenly difficult. On the other hand, if during its sojourn within the thoracic cage the goitre has grown larger than the superior thoracic opening, a different mode of attack is employed. The adenoma is steadied by forceps and scooped out until its size is reduced sufficiently for it to be extracted as in the first instance. It should be emphasized that in operations on intrathoracic goitres absolute control of the least drop of oozing is demanded.

Gottre heart—Dr J P Anderson, of the Clinic, has studied 500 cases of hyperthyroidism in which auricular fibrillation has been present, and has found that 66% per cent have been cured by thyroidectomy

Exophthalmos —According to Dr A D Ruedemann, exophthalmos has disappeared in 75 per cent of 400 cases in which the symptom was present before operation, but a group remains in which the exophthalmos persists. This is especially true of cases of long standing. There is also a small group in which, paradoxically, the exophthalmos increases after operation, even in the absence of every other symptom of the disease. The weakness and paralysis of the ocular muscles often present in cases of hyperthyroidism disappear slowly after operation, but as long as this symptom is present, nervousness and headache may persist. The widening of the palpebral fissure, which is more common than exophthalmos, disappears more rapidly than exophthalmos, and rarely persists.

CERTAIN CONDITIONS ASSOCIATED WITH HYPERTHYROIDISM

Arthritis —According to Dr W S Duncan, in 65 cases of arthritis associated with hyperthyroidism, especially those in which the spine and shoulders were involved, the arthritis disappeared after

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William H. Peters, M. D., Admitting Physician Camp for Consumptives, State of Rhode Island, Providence, R I "VALENTINE'S MEAT-JUICE was the only nourishment retained by my five year old daughter during an attack of Pneumonia She is still taking it and gaining strength I consider that it saved her life and believe it to be the best product of its kind on the market."

Dr. H. Maringer, Paris, France "I tried Valentine's Meat-Juice myself after Influenza of Gastro-Intestinal character and with adynamic tendencies. Thanks to this remedy I sustained myself during four days, when unable to tolerate anything else, and then continued taking it as an agreeable remedy with peptic effect"



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OPERABILITY

A word should be said also regarding operability Mild cases may be excluded from this discussion, for in these the surgical risk is negligible, but the fully developed case that has reached the stage of emaciation, cardiac decompensation, swollen extremities, ascites, vomiting, acidosis, and prostration, with perhaps repeated periods of delirium or continuous delirium, will be discussed

In such a case, the response to the measures outlined above will determine the operability. If, after these measures have been applied, the downward course of the patient is unchecked, as happens in only 0.2 per cent of the cases, death is inevitable. On the other hand, if the vomiting decreases and the delirium grows less, if the action of the heart is controlled, then, just as soon as the utmost value of the restorative programme has been achieved, the operation is performed. It should be added that under this plan of management several groups of cases formerly classed as inoperable have become operable, that is, we now operate in the presence of pregnancy, of diabetes, of tuberculosis, and of auricular fibrillation.

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THYROIDECTOMY

RESULTS

Operative mortality —Our statistics for the year 1929 include 1,279 operations on the thyroid gland, with 11 deaths, a mortality rate of 0.86 per cent Recently, we have had a consecutive series of 344 cases without a death. That the real operative risk in operations on the thyroid gland is confined to older patients is shown by the fact that we have performed 1,207 consecutive operations on patients under 50 years of age without a death

Late results - Among the cases of hyperthyroidism in which a report on gain or loss in weight is available, 835 per cent reported a gain In 87 per cent of the cases of hyperthyroidism, the patients were able to resume their normal occupations in less than a year from the time of operation, in 628 per cent the patients returned to work in less than six months Among the women in the child-bearing period, 192 per cent reported successful pregnancies, a figure which cannot be considered as inclusive, since there is no report in many cases Six cases of stillbirths were reported The presence of psychosis was reported in 096 per cent of the cases of hyperthyroidism, and in 0 66 per cent of the cases of simple goitre or adenoma It is not probable, therefore, that the condition was due to hyperthyroidism in more than 03 per cent of the cases

In 44 per cent of the cases of hyperthyroidism and in 78 per cent of the cases of simple there were recurrences. These recurrences has dehiefly among our earlier cases, in whith the gland was removed, and in whith the post-operative manager stressed. In our last 5,000 be much better as far as

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In 44 per cent of the cases of hyperthyroidism and in 78 per cent of the cases of simple goitre there were recurrences. These recurrences have appeared chiefly among our earlier cases, in which not enough of the gland was removed, and in which the importance of the post-operative management was not sufficiently stressed. In our last 5,000 cases, the results promise to be much better as far as recurrences are concerned.

Toxic Goitre.

By T P DUNHILL, CMG, MD

Honorary Surgeon to H M the King, Assistant Director, Surgical Professorial Unit, St Bartholomew's Hospital

HERE is a belief that toxic goitre is increasing Whether this be so or not, it is certainly very prevalent, and there can be no doubt that it is responsible for much ill-health in the community, that patients suffering from it are very unhappy, and that it causes much economic loss. In both medical and surgical textbooks the possible causes of the disease are usually fully discussed, but under the heading of treatment prominence is given to that suitable for the fully developed, rather than to the earliest stages of the disease In no other disease are the wise teachings of the late Sir James Mackenzie more opportune, and to no branch of the medical profession are the opportunities so great as to the family practitioner of recognizing the inception of a disease at a time when some alteration in the environment may be effective in restoring a patient to normal If the condition becomes established, the level of health tends to become progressively lowered, the central nervous and the cardiovascular systems have to bear an increasing strain, and throughout its course complications are likely to arise which add to the gravity of the prognosis

The family physician therefore holds a unique position. He generally knows the patient's family. In watching the children from their birth and through their illnesses, he has come to be regarded by them as their friend. He knows if sequelæ have been left from these illnesses, and he has become familiar with the temperaments of the individuals. He is acquainted with many of the problems peculiar to the household, whether they be due to ill-health, overwork, business

troubles, or the affections This knowledge is of great importance in treatment, but probably its chief value lies in the opportunity it gives of arousing suspicion at the earliest premonitions of the disease. We know that in many instances this manifests itself at one or other of the periods when the responsibilities of life begin to be felt—sometimes in early womanhood, or later when the stresses which have been well borne hitherto begin to exhaust the body's reserves

The disease itself may vary in its manifestations, and before discussing treatment some of the factors causing these variations may be indicated We have to believe that the disease is brought about by pathological stimulation which causes histo-pathological change in the thyroid gland This results in a qualitative alteration in its secretion, and the altered secretion produces the symptoms with which we are familiar The stimulation may vary in intensity, and the ability to withstand this pathological stimulation will be greater in some individuals than in others It may be brought to bear on a normal gland, or on a gland which has already undergone colloid or nodular change In the normal thyroid the whole of the epithelium responds to the stimulation, the gland becoming almost solidly cellular, and the secretion becoming highly toxic This is the primary toxic goitre (exophthalmic type) The result is seen in the extent to which the central nervous and the cardiovascular systems are affected—weakness, tremor. exophthalmos, and rapid heart rate This type is met with more frequently in the earlier decades of adult life, although it may occur at any period. In an individual with sound organs it may last a long time without complications, but these may occur at any time throughout its course If, on the other hand, the thyroid gland has undergone extensive alteration to a nodular goitre before the pathological stimulation originates those changes which render its secretion toxic, a secondary

toxic goitre results, often called a "toxic adenoma" In this case there is less epithelium to be affected, for many reasons the stimulation may be less, and less toxic secretion results It is well known that in this secondary type of the disease the central nervous system feels the effects of the toxic secretion to a less extent than in the primary type Tremor is less, and exophthalmos is generally absent, but although the toxicity is less it persists year after year, and its effects are at last felt by the cardio-vascular system The usual story is that the patient has had an enlarged thyroid gland for many years, she has become accustomed to this, and rarely associates the onset of her symptoms with it secondary type rapidity of pulse rate is frequently followed by auricular fibrillation, and later by cardiac failure Every gradation linking up these two types primary (exophthalmic) and secondary (toxic adenoma) -will be met with

There are three stages in the disease when the practitioner has to make a decision upon the course to be followed (1) At its inception (2) When the disease is established at the time the patient is first seen, but before complications have occurred (3) When complications are already present. Regarding the first stage, there is a time when it is first recognized that an individual is not quite normal. The deviation from the normal may be very slight. There may be a scarcely perceptible change in temperament, a little irritability which causes surprise and may unfortunately be put down to perversity, a little tiredness which causes disinclination to carry out ordinary duties, or enjoy accustomed pleasures, a little glistening in the eyes, or some loss of weight, unaccountable because the appetite remains good. These may be so slight as to be only recognized by one who knows the individual intimately. It is here that the knowledge of the family physician is so valuable. Lord Moynihan has recently emphasized the

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necessity for a better knowledge of normal man and the "near normal abnormal" man, surely his words are applicable to the inception of this disease When the great variations in the character of the onset in different patients are considered - in some symptoms being very slight while in others they are severe-we must believe that not every one who is subjected to influences that bring about this disease falls a victim to it There must be many people in whom the physiological mechanism nearly breaks down and just does not, there are certainly degrees in the extent to which it breaks down, there are some who become worse because some factors either within or without themselves are not controlled, while there must be some who could be restored to normal equilibrium if the cause which has broken down their defensive mechanism could be found and removed We cannot yet be sure whether the endocrine disturbance is primary and is only increased by the patient's environment, or whether environment presses heavily enough actually to cause the endocrine disharmony Whichever it is, there are some factors, one or other of which is so frequently associated with the onset of the disease that it would seem to be a definite factor in its production. At this stage the removal of the cause, if it can be found early enough, together with appropriate treatment, may be the determining factor in restoring the patient to health The consulting physician rarely, and the surgeon never, sees the patient at these early stages, and this is the only time when there is the possibility of cutting short the disease and preventing those years of ill-health that so often follow Amongst the causes to be looked for are local foci of infection, and mental strain Infection of tonsils, sinuses, or teeth would seem to be most important in this disease. The causes of mental strain are many, and may be difficult to detect Sometimes they can be removed or alleviated,

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been commenced early The following group of young patients is instructive —

Two sisters, one aged 8, the other aged 15, are both definitely improving under medical treatment. One boy, aged 8, and one girl, aged 15, died in hospital while under treatment. One girl, aged 17, was kept in hospital some months. She failed to improve, became very emaciated, and the proptosis was extreme. One superior thyroid artery was ligated, and later the other. The gland was dealt with in two stages. This patient is now quite well.

The second stage at which it is necessary to decide on the procedure to be followed is when the practitioner sees a patient in whom the disease is well established. but before any complications have supervened patient has now got beyond the stage at which it would seem possible to restore her to normal at all quickly by removing any load that can be discovered. She has probably been ill for some months, or years, exacerbations occurring from time to time, and after each of these she settles down to a level of health far below normal She may still be able to carry on some of the activities of life, though these are greatly limited as regards both work and pleasure The type of the disease met with at this stage may be either primary or secondary In the primary condition the gland is generally bilaterally symmetrical, and all the signs and symptoms usually associated with exophthalmic goitre will be present If the condition is secondary, there will be less tremor, and probably no eye signs, the patient complains of rapid heart rate, fatigue, and mability to do what she has been accustomed to do The goitre will be of the nodular type, single or multiple, but sometimes the multiple nodules are quite small and distributed throughout the gland so that the enlargement is symmetrical and may approximate in appearance to the primary type

Taking the secondary type first X-ray or medical treatment is likely to do little good in this class, and the heart condition is liable to deteriorate. The patient

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sometimes this is difficult or impossible to accomplish If it can be done, it is of the greatest benefit

Together with elimination of any of these factors physical rest should be given The physician must judge whether this rest should be absolute in the beginning It is often wise to put a patient to bed for three weeks or a month If complete rest in bed for a longer period is insisted upon, it may defeat its own object by becoming irksome to the patient—and peace for the mind is as essential as rest for the body Small doses of iodine should be given, and Lugol's solution is a convenient preparation Although big doses will often give rapid improvement, they lose their effect if given over a prolonged period Also large doses if continued can make the patient very ill Small doses cause involution in the gland with improvement in the symptoms, and may be continued Another reason why small doses should be given in the general management is that large doses may be required for a limited time in the preparation of the patient for operation, should this ultimately become necessary

Even though there is good hope that these measures may be effective, the long view must be taken. When the histological appearance in early Graves' disease with the universal hyperplasia is considered, it will be realized that much change must take place in the gland itself before it is restored to a resting condition. There is evidence that the administration of iodine does bring about this change, but it must be remembered that unless the causes which brought about the disease are eliminated, the gland cannot be expected to return to normal. Even when a patient begins to improve, careful management must be continued. It is a disease characterized by a tendency to relapse, and it may be a long time before mental and physical strain can be safely undertaken. Some patients do not improve even though every care has been taken and treatment has

TOXIC GOITRE

to deal with them when present As examples of patients in this stage I might mention two —

One, a doctor of science, who had all the signs and symptoms of the disease, has been able to resume his duties after medical treatment only. A second, a married woman, with symptoms for five years, had been unable to do any work for five months. Following operation, she recovered quickly. Within a year she became pregnant, and six weeks after the birth of the child stated that she was able to do all her housework, including the care of the baby.

The third stage at which a decision must be taken is when complications have arisen These include auricular fibrillation, with or without cardiac failure, glycosuria, mental disturbance, and corneal ulceration This stage may be reached in either the primary or the secondary type of the disease The patient's reserves in one or other of the systems have been exhausted to an extent that practically precludes the possibility of a return to normal by medical means, and it is not right to continue medical treatment any longer than is necessary to fit her for the operation Except in the very latest stages, an operation can be relied upon to give great relief, but the extent of this relief will naturally depend on the extent to which organic change has taken place in the organs or systems of the body Some of these patients may be so ill that the idea of operation may seem to be out of the question, but although it would be unreasonable to state that all patients can be operated upon with a fair degree of safety, it is really surprising how satisfactorily even very ill patients will stand operation if physician and surgeon collaborate in the preparation, if proper precautions are taken, the right time chosen, and the extent of the operation graded according to the patient's strength The degree of restoration to health in these patients is also surprising when a sufficient amount of the thyroid gland tissue has been removed

Three instances may be given of the management of very ill patients, one with auricular fibrillation and

will naturally always be better with adequate rest and symptomatic treatment than she would be if these measures were neglected, but in spite of them the symptoms tend to increase. Operation for these patients is safe, and an adequate operation restores the patient to practically normal health.

If the condition is primary, the necessity for operation is not so urgent, and the removal of any factors which may be associated with it in a causal relationship will give considerable relief Whether medical or surgical treatment is then undertaken may depend to some extent on the social standing and the wishes of the patient If the patient is well-to-do there is less urgency for operation, for she will be able to live a sheltered life and obtain the requisite rest for an extended period Without doubt a certain amount of good can be done by X-ray or medical treatment in wellestablished cases It cannot be achieved always, and if this course is undertaken both patient and practitioner must be prepared for a long period If the patient is compelled to earn her living or manage a household, this rest cannot be obtained Operation should then be undertaken as soon as she has had the necessary preliminary treatment, for when complications have not arisen, an adequate operation can be relied upon to restore a patient to her place in the community in the great majority of cases Even the more favourably situated patient may weary of the prolonged medical treatment and become anxious to regain sufficient health and vigour to live a more natural life Furthermore, not all patients respond to medical treatment, and it may become apparent that surgical intervention is necessary In this disease complications sometimes occur even when patients are being managed under apparently ideal conditions. These complications can be very damaging. It is far better to anticipate and prevent them rather than have

TOXIC GOITRE

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Three instances may be given of the management of very ill patients, one with auricular fibrillation and

congestive heart failure, one with glycosuria, and one with mental symptoms and auricular fibrillation —

Case 1 -Heart failure and adema -This patient, aged 57, the sister of a medical man, had been ill for ten months Her medical treatment had been well carried out. In spite of this, she had, from the beginning, progressively lost ground When seen by me a bilateral enlargement of the thyroid gland was present, with extreme emaciation, tremor, auricular fibrillation and heart failure The edema reached to the angles of the scapulæ The abdominal cavity contained free fluid The ædema had caused such distress that two months previously the left leg had been incised above the ankle, and from this there dripped from one to two pints a day If drainage ceased, the patient became very uncomfortable She was lifted out of bed each day into a chair, because this made the drainage from the leg more satisfactory The amount of urine passed was little over a pint a day, and sometimes less A persistent cough was most dis-The appetite had remained good throughout Digitalis, diuretin and the usual drugs had failed to relieve the ædema or increase the amount of urine Both superior thyroid arteries were tied under local anæsthesia Following this there was slight improvement, but the urine did not increase in amount, nor did the ædema lessen A fortnight later } c cm novarsurol was given, and during the next twenty-four hours 88 ozs of urine passed Two days later 1 c cm was given, and 123 ozs of urine passed The day following this a partial thyroidectomy was performed In a few days the improvement was noticeable and continued The ædema disappeared, the drainage puncture closed and the cough ceased Nineteen days after the operation 23 grains of quinidine were given twice one day, three times the next Five grains were then given twice a day for two days, then three times a day On the first day that the five grains were given three times a day the pulse rate became regular, and has remained regular

Case 2—Diabetes—The family history of this patient is interesting. One sister and one brother died of diabetes. The grandfather and an uncle have diabetes. The father is paralysed in both legs. In 1921, at the age of 17, the patient developed all the symptoms of primary toxic goitre. She was 12 weeks as an inpatient in a metropolitan hospital. After that she lived a quiet life and gradually improved. In 1925, at the age of 21, all the symptoms recurred. In 1926 she came to St. Bartholomew's Hospital, but it was early in 1928 before she could be admitted. The urine was then found to be heavily laden with sugar. She was kept in bed for 4½ weeks under Professor Fraser, the glycosuma being controlled by insulin. Operation was then carried out. A month later insulin was omitted. The signs and symptoms of the disease have practically all disappeared. The patient has remained well since, and is earning her living.

Case 3 —Mental symptoms and auricular fibrillation —This patent was aged 66 She had had an enlarged thyroid since early

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life For 8 months previous to operation tachycardia was severe She had been an in-patient in a metropolitan hospital when mental confusion began each evening, the mind being clear during the day. Three months later the mental symptoms increased, and the patient was transferred to a mental hospital. She remained there for three months. During these three months, auricular fibrillation commenced and continued. Quinidine was given for this without effect. After due preparation an operation was performed. The patient's mentality was disturbed at night, but gradually improved. Eight days after the operation, small doses of quinidine were given and gradually increased until five grains were given twice a day. On the third day in which ten grains were given, the pulse became regular in rhythm. The mental condition became completely clear, and this patient is now well in mind and body.

Many surgeons would insist upon operation almost as soon as the disease is diagnosed, believing that once the disease has become established normal health is unlikely to be obtained apart from operation Certainly after the stage at which the surgeon usually sees a patient with Graves' disease, relatively few attain normal health without operation, but some do, and the patient has the right to choose, so long as the facts or probabilities are fairly put before her In the earlier stages it is different From the histories of patients who come for advice suffering from other troubles, from time to time we learn that some who have undoubtedly suffered from toxic goitre have been completely cured, and we all know some individuals who have been cured Furthermore, we are not yet sure of the cause of this disease In the early stages the cause is probably still active, and if operation is carried out at that stage. recurrence is likely, the remaining portion of the gland enlarging, causing the signs and symptoms of the disease, and necessitating further operation It may be argued that some of the causes continue to operate throughout life, this may be so, and is probably the reason why results in some few cases fall short of what is desired But there certainly comes a time in the history of patients not cured spontaneously or by medical means, when delay in operating is fraught with

serious danger to the patient and it is true that, in the great majority of cases, even when grave complications have occurred, an adequate operation restores the patient to a level of health which enables her to live a useful life in the community

Medical treatment throughout the course of the disease is much the same We strive to obtain mental and physical rest Before beginning this, any septic focus should be removed, unless the patient is too ill when first seen Iodine is the only drug which appears directly to influence the course of the disease crisis, particularly when associated with vomiting, thirty minims of Lugol's solution of iodine given per rectum and repeated in three hours is often very valu-After that it can usually be given by the mouth The doses are frequently too large, and harm can result from this Hydrobromide of quinine is useful in some cases, and sedatives are sometimes necessary Digitalis will not lower the pulse rate apart from congestive heart failure Rest should be complete only so long as it does not prove irksome to the patient Sufficient rest should then be given each day to prevent physical or mental exhaustion With all medical treatment, the long view must be taken

X-ray treatment sometimes does good The earlier in the disease it is used, the more effective it is likely to be Some patients do not respond to it, others improve for a certain time, or to a certain extent, and then relapse I cannot consider that the condition of patients treated by X-rays compares with that of patients who have undergone an adequate operation, either in the extent or the permanence of the improvement It is sometimes useful when a little too much gland tissue has been left at operation

Radium is being tried out in hospital centres—Its use is still more or less in the experimental stage, and its value and dosage are not yet sufficiently known to

TOXIC GOITRE

justify its general recommendations

If surgical treatment is to be carried out, time must be taken for adequate preparation. It is assumed that sufficient rest has been given, and that septic foci have been removed earlier in the course of the disease. The patient may be too ill for this to be done until after the thyroid operation. It is now well known that iodine decreases the risk of operation. If the doses given during the medical treatment have been small, larger doses will be given for ten or fifteen days preceding operation. When any of the complications are present, medical and surgical co-operation are more than ever necessary, so that the operation should not be undertaken at any time other than that which is the best for the patient.

Regarding the results of operation A consecutive group of 205 patients has been carefully followed up recently Answers have been received from practitioner or patient in all but 20 Some of these latter are abroad, and I expect replies from more yet 167 (90 per cent) are able to lead their normal lives Four died some time after operation, one from high blood pressure five years after, one from hydronephrosis, one from an abdominal operation, and one from heart failure a year after the operation

Of 121 patients with permanent auricular fibrillation, 96, or 80 per cent, are leading normal lives. In 60, normal rhythm returned spontaneously following operation, in 36 others a short course of quinidine was necessary

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children An extreme pathological degree of this lymphatism is, however, a rare condition. It does not, for instance, occur in children with the frequency with which sudden death under anæsthesia occurs, though lymphatism is often given as a cause of death in these circumstances. That error is due to the failure to recognize that all children have an active thymus and an active secretory thyroid.

As puberty approaches the lymphogenic activity of the thyroid apparatus begins to decline When genital function is fully established (18-21 years) the lymphogenic activity of the thyroid apparatus reaches a minimum The mediastinal thymus is emptied usually by the sixteenth year The small islands of thymus normally placed in the neck are sufficient to accommodate the normal amount of lymphogenic secretion produced by the thyroid of the adult This striking fall in thyroid lymphogenesis with a corresponding rise in the genital function is not a mere quantitative change in There is also a qualitative change the individual Children with well-marked thymic lymphatism, even of a pathological degree, do not get thyrotoxicosis When thyrotoxicosis does occur in children it occurs in assoth a precocious puberty prior to the onset of

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Thyrotoxicosis.

By G SCOTT WILLIAMSON, M C, M D

Mackensie McKinnon Research Fellow, Royal Colleges of
Physicians and Surgeons

AND INNES H PEARSE. M D

HYROTOXICOSIS is a group of symptoms which are each or all relieved by the removal of part of the thyroid apparatus. In every case the toxicity for which treatment is sought is derived from the thyroid apparatus. Thyrotoxicosis is not a disease. It may, indeed, be the result of more than one disease. The disease leading to thyrotoxicosis may have origin in the thyroid apparatus itself, or may arise through disorders of the general body metabolism indirectly affecting the thyroid apparatus.

The thyroid apparatus consists of the thyroid, thymus and parathyroid glands. The thymus is an essential part of this mechanism. It is in fact the reservoir wherein one of the thyroid secretions is stored. Hence, either thyroidectomy or thymectomy can relieve some or all of the symptoms which together are included in the term thyrotoxicosis.

The thyroid apparatus has two recognised functions. The first of these is the storage of colloid within the thyroid gland. The second is the production of a secretion in the thyroid which causes lymphocytes to appear in the thymus. We have named these two functions the Iodo-colloid Function and the Lymphogenic Function.

Lymphogenic activity is the striking feature of the thyroid apparatus in children. The distinction between the child and the adult lies in the extent of lymphogenic activity occurring in the thyroid apparatus. It is never absent in children, though it varies through wide limits. Some thymic lymphatism is always present in normal

children An extreme pathological degree of this lymphatism is, however, a rare condition. It does not, for instance, occur in children with the frequency with which sudden death under anæsthesia occurs, though lymphatism is often given as a cause of death in these circumstances. That error is due to the failure to recognize that all children have an active thymus and an active secretory thyroid.

As puberty approaches the lymphogenic activity of the thyroid apparatus begins to decline. When genital function is fully established (18-21 years) the lymphogenic activity of the thyroid apparatus reaches a minimum. The mediastinal thymus is emptied usually by the sixteenth year. The small islands of thymus normally placed in the neck are sufficient to accommodate the normal amount of lymphogenic secretion produced by the thyroid of the adult. This striking fall in thyroid lymphogenesis with a corresponding rise in the genital function is not a mere quantitative change in the individual. There is also a qualitative change Children with well-marked thymic lymphatism, even of a pathological degree, do not get thyrotoxicosis. When thyrotoxicosis does occur in children it occurs in association with a precocious puberty prior to the onset of symptoms.

At the other end of life there is a similar inversion of the functions of these two systems. The first herald of the menopause is the re-appearance in the mediastinal thymus of lymphocytes and the corresponding changes in the thyroid activity. This increase runs pari passu with the decline of the genital function. The pre-menopause, like puberty, is a time at which thyrotoxicosis may appear. Further, the thyrotoxicosis can and does in some cases disappear with the full establishment of the menopause, that is to say, when genital function has ceased and the thyroid apparatus has reverted to a condition simulating the pre-puberty

stage

It is clear, then, that the genital and thyroid functions are reciprocal functions working in very close inter-dependence Prior to puberty the thyroid apparatus pursues a steady course in one direction the development of the genital function this steady course in one direction is stayed. For a time there are now two directions in which the underlying functions can operate—the waning thyroid function and the waxing genital function In the male there seems to be a very steady transference from the lymphogenic function of the thyroid to the genital function without interruption, so that stability is the rule. In the female steady transference is interrupted by menstrual periodicity which continues from puberty to the menopause In conjunction with menstruation and in early pregnancy there is a definite change in the thyroid apparatus towards the pre-puberty state Thus, it is clear that there is a degree of instability in these reciprocal functions in the female This instability is shown in the fact that 25 per cent of average young women from 15-22 years of age show a definite increase in blood iodine immediately prior to menstruation The variation is not large, rising from 13γ to 19γ , or from 9γ to 18γ , or from 5γ to 11γ . This instability of the blood rodine level tends to pass off, since only 1 per cent of women from 25-40 years show this peculiarity There is a similar acquired instability in the blood calcium level at these times This brings the parathyroid gland into the picture

Pregnancy has a similar effect. In its earliest stage, up to the first month, both the thyroid apparatus and the blood iodine fluctuate through wide limits. That is to say, they are more unstable. So also is the blood calcium level unstable. Both menstruation and pregnancy are periods at which some part of the genital function is temporarily suspended. These are times

THYROTOXICOSIS

when reciprocal changes similar to those in the prepuberty state are found in the thyroid apparatus

Experience indicates that there is a peculiar diathesis in those individuals who acquire thyrotoxicosis. This depends upon the persistence through puberty and adult life of the pre-puberty state of thyroid function, or in old age the premature return of the pre-puberty state before the genital function ceases at the menopause. Thus for thyrotoxicosis to occur two things are necessary, active genital function and a persistent status thymico-lymphaticus. It is apparently this disturbance in the balance between the genital function and the thyroid function which is at fault

We have seen when the genital function is not in a position to function the thyroid gland shows signs of activity in the production of lymphatism in the thymus. There is a broad basis normally for this reciprocal balance. In the thyrotoxic diathesis the fulcrum is not only set too near the thyroid side but there is also undue weight on the thyroid side. Little is, therefore, needed to precipitate a thyroid dystrophy and set in being a thyrotoxicosis.

These people are crossing the deep stream of life on a very narrow plank. The least push and they are in the depths. Once they are in the depths the most that medicine can do is to throw them a life belt. Medicine cannot pick them out, and set them on the bridge again it can only hold the life line attached to the belt, and guide them to a comfortable backwater. Perhaps a previous knowledge of the diathesis may enable the practitioner to keep them on the narrow plank.

The person prone to thyrotoxicosis is living alternately with a high basal metabolic rate and a normal rate, either agitated and nervous, or gloomy and lethargic. There is no happy medium for these patients. If we were dealing with a metabolism which was alternately building itself up and breaking itself.

down we might expect a forward movement by Jerks This unfortunately is not the case, because the basal metabolic rate is increased primarily by the consumption of protein, as the respiratory quotient indicates There is, of course, a commensurate fat and carbohydrate consumption. But in the normal individual the fats and carbohydrates are consumed to spare the protein. In this diathesis protein is not spared. Thus physical capacity is not increased by the high basal metabolic rate. It is diminished. The individual is stirred to do much, but the capacity to achieve is diminished. He leads a life of perpetual frustration of endeavour. Asthenia is a constant sign of the diathesis, but not lethargic asthenia. Indeed, it is the opposite—a restless asthenia.

The diastolic blood pressure is low, but the systolic pressure is at or about normal, i.e. it is at that level at which work can be done. To do it, however, needs immense endogenous effort to overcome the handicap of the low diastolic starting point. Even kidney function is therefore taking it out of the individual. It is probable that this applies also to the muscular tone of the heart, at each diastole it sinks lower than normal, to operate, it must rise at least to normal systole. Endogenous energy is used to effect this. The individual is further subject to recurrent fever—no less a fever because it is apprexial. Indeed, the temperature is almost always subnormal in these cases.

We can but infer from this that the whole metabolism is maintained at a higher rate than normal, but without the aid of the normal temperature level. The alternative methods of conducting chemical interchange at a constant level is to maintain the temperature or to reduce the internal pressure. The prevailing temperature is low—internal pressures must therefore be reduced. The ionised salts are in low concentration, moving quickly within their solutions. The thyroid

THYROTOXICOSIS

apparatus, we know, controls two of the minerals calcium and iodine, and perhaps through these the balance of the other minerals in the metabolic turnover. Thus in these people the calcium limits in the blood swing from 3 mg. to 16 mg at different times, and the iodine from 4γ to 19γ . It is not, however, the quantity of either of these in the blood at any moment that is characteristic, it is that at one moment they are low, and at another moment they are high. Instability of the threshold values is a feature of this diathesis

This swing in the iodine levels in all probability accounts for a characteristic feature of the diathesis, fluctuation in the size of the thyroid gland. Sometimes the thyroid is evident on inspection and at other times cannot be seen. It is not the presence of the goitre so much, but that it varies in size and consistence through a wide range. Indeed, the goitre may be small or absent, but the fluctuations are still evident on palpation. This and the general temperament may serve to establish evidence of the particular diathesis. The whole picture is that of an unstable individual who stands at one extreme limit of the average. It needs but a touch in certain directions to push him out of the average and beyond the limits of the normal

The close reciprocal function of the genital apparatus and the thyroid apparatus indicates that sexual upsets are the most common points of attack. It is not difficult to persuade individuals with this diathesis, both male and female, to adjust their actions to the capacity of their asthenic bodies and to forgo the attempt to live up to their intentions and high aspirations. The practitioner can do much to ward off attacks of thyrotoxicosis

TYPES OF THYROTOXICOSIS

Thyrotoxicosis when it does arise may fall into one of four types

(1) The first type is best described as Graves' Disease,

and this term should be reserved for this particular type The characteristic picture of Graves' disease is that it manifests all the symptoms of thyrotoxicosis Nothing is missing, exophthalmos, cardiac instability. soft forceless pulse, sub-normal temperature, asthenia, tremor, flushing, mental and nervous agitation, wasting, and high basal metabolic rate, high pulse rate and high blood iodine Nothing short of the full syndrome should be classed as Graves' disease Certain secondary symptoms are of less importance glycosuria, diarrhea, ascites, ædema, etc The symptoms may have an insidious onset and slow course, or a sudden onset (e g within four hours of a shock) and rapid course The order of onset may be with exophthalmos, tremor, increase in weight followed by slow wasting and by tachycardia, or the tachycardia and wasting may precede the exophthalmos, tremor, etc , or the heart failure may be the initial symptom proceeding through tachycardia to exophthalmos

Surgical treatment results in disappearance of the symptoms. The first effect is the lowering of the basal metabolic rate, pulse rate and blood iodine to normal or even subnormal levels. More slowly the exophthalmos and tremor disappear. Often, however, only the basal metabolic rate, pulse and blood iodine are affected, leaving the patient with exophthalmos, tremor and a degree of adiposity. Obviously the symptoms in Graves' disease occur in groups, that of which exophthalmos is the principal, and that of which high blood iodine and high basal metabolic rate are the principal.

It must be borne in mind that a high basal metabolic rate, high pulse rate, wasting and high blood iodine are the signs of experimental thyroxin intoxication. The other symptoms cannot be induced by thyroxin ingestion. There are, therefore, in Graves' disease two clear groups of symptoms with at least two toxic.

THYROTOXICOSIS

factors

- (2) The second type of thyrotoxicosis we call Simple Thyrotoxicosis It is that in which the group of symptoms linked up with exophthalmos is absent There are present a high basal metabolic rate, a high blood iodine, wasting, high pulse rate, subnormal temperature and nervous agitation of an extreme nature It corresponds entirely to the condition induced experimentally by thyroxin intoxication and is due to overaction of iodo-colloid When surgical treatment is successful—and successes seem fewer in this type than in others—the symptoms disappear simultaneously
- (3) The third type is not common, but it is very striking when it is encountered. This type we call Exophthalmic Goitre. It lacks all signs of thyroxin intoxication. There is no wasting. Indeed, a peculiar adiposity may be a feature of this condition. The pulse is normal in rate but is soft, the heart is asthenic and flutters on exertion, the blood iodine is normal, the basal metabolic rate is normal or even low, mental anxiety is present, but no agitation—rather there is lethargy. This is a state to which surgical operation for Graves' disease may reduce a patient. Further operation with removal of the greater part of the remaining thyroid gland removes this group of symptoms.

Thus the two groups of symptoms which make Graves' disease can occur naturally as distinct syndromes, making it clear that there are at least two toxic elements elaborated by the thyroid apparatus, each removable by adequate surgical treatment

(4) The fourth type can be described as the *Cardiac Asthenic* type. The principal symptoms in the cases recognised up to now have been cardiac asthenia and irritability with an irregular, though not necessarily rapid, pulse. This may go on to auricular fibrillation. Unless the condition is complicated by thyroxin intoxi-

cation there is no tachycardia and no raised basal metabolic rate. Indeed, the condition may escape recognition until extreme degrees of heart failure ensue. A further difficulty in connecting these cases with thyrotoxicosis is that the thyroid need not present itself as a swelling in the neck, though it is invariably recognisable on palpation. The diagnosis, therefore, rests almost entirely on the recognition of the goitre

We hazard the opinion that this cardiac asthenic type of thyrotoxicosis will become one of the most important of the groups because of the almost spectacular success of surgical interference in a case with complete heart failure and widespread ædema. We, therefore, feel justified in advising in all obscure cases of cardiac failure at or about the menopause that careful steps should be taken to exclude thyrotoxicosis as the underlying cause.

The above four types of thyrotoxicosis include 90 per cent of all cases. The other 10 per cent present a confused mixture of these types which it is difficult to place in any one category. They do not exhibit any additional

symptoms

These four types of thyrotoxicosis are distinct because —A simple thyrotoxicosis may become a fully-developed Graves' disease, as, for example, by administration of iodine, a simple exophthalmic goitre may become a fully-developed Graves' disease, a cardiac asthenia with goitre may become a full Graves' disease or a simple thyrotoxicosis. But, on the other hand, Graves' disease can never become a simple thyrotoxicosis nor can a simple exophthalmic goitre become a simple thyrotoxicosis. The exophthalmic group of symptoms is very clearly a separate intoxication which may arise de novo or may be grafted upon a thyroxin intoxication. This group we attribute to a dystrophy of the lymphogenic function of the thyroid, while the thyroxin intoxication is referable to a dystrophy of the

THYROTOXICOSIS

iodo-colloid function of the thyroid

It is difficult to know when to interfere by surgical treatment in the course of the different types of thyrotoxicosis Most cases of thyrotoxicosis, but by no means all, reach their climax by a series of exacerbations, and it appears to be the general consensus of surgical opinion that cases are only suitable for operation after the disease has reached a stability The decision to operate must rest with the surgeon in every case because each case seems to present its own special difficulty In every case any trial administration of iodine as a therapeutic measure is not advisable Iodine in 70 per cent of cases can control, for a short time, the thyroxin intoxication when present in thyrotoxicosis Its effect is transient But when used the effect may be so striking that it is often continued too long and soon may cease to have any effect, or may even acquire a vicious effect Any failure of iodine to act on the thyroxin intoxication further complicates the problem for the surgeon In the present state of our knowledge of this subject 10dine in thyrotoxicosis should be strictly reserved for the use of the surgeon as a part of a surgical procedure For the surgeon it is invaluable in so far as it affords a means of reducing the severity of the condition long enough to allow him optimum conditions in which to carry out surgical measures, which, after all, at the moment are the only practical hope of improvement for the established case

Impressions of American Medicine.

By R SCOTT STEVENSON, MD, FRCSE

SHORT visit may give a more vivid impression than a prolonged stay, and in this article are described some outstanding features of American medicine as they struck me on a recent holiday in America Coming developments in England in the way of clinics and post-graduate education give them a topical interest The laws governing medical practice vary from State to State in the United States, and a few years ago it was quite easy to procure a charter to incorporate a medical school anywhere in the Union In the 'eighties and 'nineties of last century proprietary medical schools sprang up all over the United States, and from first to last there have been about 450 medical schools of one sort or another, although they were never all in existence at the same time Twenty years ago there were 186 medical schools of various grades, but to-day this number has diminished to 76, all but two or three of which are graded as Class A This has been brought about chiefly by the influence of the American Medical Association, which inspected medical schools and issued a black list of them, and by the effect of the publication in 1910 of Dr Abraham Flexner's famous report on medical education to the Carnegie Foundation for the Advancement of Education, which was merciless on the low-grade schools, and irrefutable

University education in general is more widespread and more usual than in England, though the standard is not uniformly high, each State has a State University, where education is free, in addition to the older foundations such as Harvard and Yale, and the many proprietary institutions which arrogate to them-

selves the title of university Quite insignificant universities have as many as 10,000 students, and Ann Arbor University, the largest, I am told, has, with its associated colleges, a total of 35,000 students. In order to cut down the increasing number of would-be medical students the Class A medical schools are demanding a higher and higher standard of general education—some are beginning to insist on a university degree in arts or science before beginning the study of medicine—with the result that the average age of qualification for an American medical practitioner is now twenty-seven. As Dr. William J. Mayo has pointed out, in America the pendulum has swung from the poor medical school with its one virtue of teaching clinical medicine to the splendid medical schools of to-day, which place less emphasis on clinical and bedside instruction and stress rather education for education's sake, "while the purpose of medical education, the relief of the sick, is almost forgotten"."

UNIVERSITY OF CHICAGO CLINICS

I rather gained that impression at the University of Chicago, one of the three great universities in Chicago. It has been endowed by the Rockefeller family with 100,000,000 dollars, and has had other generous benefactors as well. Built round a fine park, or campus, it frankly imitates the buildings of Oxford and Cambridge. It is rather more like Oxford than anything at Oxford, but while in Oxford they are pulling down the creepers from their old walls to preserve them, in Chicago they are carefully training the creepers up their bright new walls to make them more picturesque.

The Clinics (hospital group) of the University have some 450 beds, and are among the most beautiful hospital buildings in the world. They are intimately related to the departments of medicine, surgery, obstetrics and gynæcology, pædiatrics and pathology

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of the University and staffed by full-time members of the University Faculty It is stated that all the facilities of the hospitals are open to every patient regardless of what he or she can pay, but when a patient enters the hospital out-patient department he may be seen as a private patient (fee, ten dollars, or £2), as a semi-private patient (fee, five dollars, or £1), or in the general out-patient department (usual fee, three dollars, or 12 shillings), "occasionally," it is stated, "even lower rates are allowed or free cases admitted " All the out-patients are seen by appoint-In-patients are similarly treated under three categories, ranging from 14 dollars a day (roughly £3) in a private room, down to five dollars a day (£1) in the pavilion There are extra charges for X-rays, electrocardiograms, etc., but not for general laboratory work It is notable that a system of selective admission is in operation, "by means of which cases which are of especial interest to the Staff for the purposes of teaching and study are selected for admission to the Clinics " So that the patients get a hospital de luxe, and the university teachers and their students get hand-picked clinical material. The poor people in Chicago go to the Cook County Hospital, which is a great barrack of a municipal hospital, with over 3,300 beds, more like the hospitals of Paris or Vienna than those of our country

NEW YORK MEDICAL CENTRE

One of the greatest experiments in modern medicine is the Medical Centre in New York, which comprises a huge mass of buildings towering over Riverside Drive at the upper end of the island of Manhattan At present it has 1,674 beds, but when the Centre is completed, in a few years' time, it will have a population of 10,000 persons—patients, doctors, nurses and staff It is an amalgamation of the Presbyterian Hospital, the Sloane Hospital for Women (of which

AMERICAN MEDICAL IMPRESSIONS

Dr B P Watson, formerly Professor of Midwifery at Edinburgh, is director), the Vanderbilt Clinic (for out-patients), the Babies' Hospital, the Squire Urological Clinic, the Psychiatric Institute and Hospital, the Neurological Institute and Hospital, the Harkness Private Patient Pavilion (presented by Mr Edward S Harkness, who recently gave £2,000,000 in trust to this country), and the College of Physicians and Surgeons of Columbia University (the medical school)

The Medical Centre was founded in 1928 with an endowment of 40,000,000 dollars At its dedication

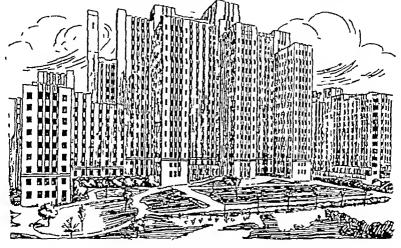


Fig. 1 —The Medical Centre, New York

it was stated "Although service to the individual patient, in ward or private room, is the immediate function of the coalition, sponsors of the Centre find even greater fields of usefulness in the facilities for medical education and research afforded by so large a co-ordinated effort. Medical students and laboratory workers now have close at hand opportunities for study in lines that have been widely separated professionally as well as geographically". The patients (with few exceptions) pay fees for their treatment in wards, semi-private rooms and private rooms, ranging up to

of the University and staffed by full-time members of the University Faculty It is stated that all the facilities of the hospitals are open to every patient regardless of what he or she can pay, but when a patient enters the hospital out-patient department he may be seen as a private patient (fee, ten dollars, or £2), as a semi-private patient (fee, five dollars, or £1), or in the general out-patient department (usual fee, three dollars, or 12 shillings), "occasionally," it is stated, "even lower rates are allowed or free cases admitted " All the out-patients are seen by appointment In-patients are similarly treated under three categories, ranging from 14 dollars a day (roughly £3) in a private room, down to five dollars a day (£1) in the pavilion There are extra charges for X-rays, electrocardiograms, etc., but not for general laboratory work. It is notable that a system of selective admission is in operation, "by means of which cases which are of especial interest to the Staff for the purposes of teaching and study are selected for admission to the Clinics. So that the patients get a hospital de luxe, and the university teachers and their students get hand-picked clinical material. The poor people in Chicago go to the Cook County Hospital, which is a great barrack of a municipal hospital, with over 3,300 beds, more like the hospitals of Paris or Vienna than those of our country

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sity of Pennsylvania, the Graduate School of the University (now under Dr G Tucker), Jefferson Medical College (now under Dr L Clerf), and Temple University (where Professor Jackson is now working, aided by his son, Dr C L Jackson) Temple University is a comparatively recent foundation, but it has 10,000 students in its various schools, and in the hospitals associated with it are some 600 beds

There have been few more interesting developments in surgery than that of peroral endoscopy, and this has been due to the pioneer work of Killian (1896) and to the writings and demonstrations of Chevalier Jackson It shows the trend of specialization in medicine that endoscopy has become a specialty within a specialty Chevalier Jackson is a little man with an uncon-

scious and irresistible charm, who lives only for his work and his patients He does not encourage the casual spectator at his clinic to go away with the idea that he has learned the technique of bronchoscopy by watching over his shoulder the treatment of a few cases, and he does not talk about the cases during the clinic The first morning I saw him working in his operating theatre there were seventeen cases, he began at 8 15 a m and finished sharp at 11 15 a m some surgeons take a few minutes for preparation and a few hours for operating, Chevalier Jackson takes hours or even days in preparation (X-raying the patient in different positions, practising a separate technique on a dummy for the removal of an unusual foreign body, even making a new instrument if necessary), and a few minutes or more often seconds in operating

Chevalier Jackson works with a highly trained team. The patient lies on the operating table with the surgeon at the head of the table, his first assistant holding the patient's head, and the second assistant his shoulders. The duties of the assistant who holds the

30 dollars (£6) a day in some of the rooms of the Harkness Pavilion, but the patients in that Pavilion are in an atmosphere that has little in common with that of a hospital, each private patient has not only his own bathroom and telephone (that goes without saying in America), but his food is kept in his own private ice-chest, and there is a charming restaurant for the use of patients' friends Small wonder that many of the attending medical staff are giving up their consulting-rooms down town in New York, being provided with consulting-rooms in the Harkness Pavilion

The Medical Centre is magnificent, but the doctors in its vicinity have little to say in its favour, their patients are not unnaturally deserting them to go to the Centre, where they pay fees (and not small fees) and even in the out-patient department are treated as private patients I was told of a patient being involved in a slight accident, treated at the Centre, and going to his own doctor next day, but when he did not turn up again at the Centre they telephoned to him, and, not getting a satisfactory answer, sent one of their Social Service Staff to interview him! Nevertheless, the future is to the medical centre, at least in New York Already Cornell University and the New York Hospital are building another great medical centre with 1,600 beds, overlooking the East River At present it looks like the skeleton of a gigantic, unbelievable cathedral

CHEVALIER JACKSON

The University of Pennsylvania Medical School is the oldest in the United States, and has had many distinguished medical men associated with it, but to any surgeon whose interest lies more especially in diseases of the nose and throat Philadelphia means Chevalier Jackson He has now organised four bronchoscopic clinics in Philadelphia—at the Univer-

sity of Pennsylvania, the Graduate School of the University (now under Dr G Tucker), Jefferson Medical College (now under Dr L Clerf), and Temple University (where Professor Jackson is now working, aided by his son, Dr C L Jackson) Temple University is a comparatively recent foundation, but it has 10,000 students in its various schools, and in the hospitals associated with it are some 600 beds

There have been few more interesting developments in surgery than that of peroral endoscopy, and this has been due to the pioneer work of Killian (1896) and to the writings and demonstrations of Chevalier Jackson It shows the trend of specialization in medicine that endoscopy has become a specialty within a specialty Chevalier Jackson is a little man with an uncon-

scious and irresistible charm, who lives only for his work and his patients He does not encourage the casual spectator at his clinic to go away with the idea that he has learned the technique of bronchoscopy by watching over his shoulder the treatment of a few cases, and he does not talk about the cases during the clinic The first morning I saw him working in his operating theatre there were seventeen cases, he began at 8 15 a m and finished sharp at 11 15 a m While some surgeons take a few minutes for preparation and a few hours for operating, Chevalier Jackson takes hours or even days in preparation (X-raying the patient in different positions, practising a separate technique on a dummy for the removal of an unusual foreign body, even making a new instrument if necessary), and a few minutes or more often seconds in operating

Chevalier Jackson works with a highly trained team The patient lies on the operating table with the surgeon at the head of the table, his first assistant holding the patient's head, and the second assistant his shoulders The duties of the assistant who holds the

head are almost as important as the operator's, he must co-operate with the surgeon and manœuvre the patient into such a position that the bronchoscope can be passed into any lobe of either lung, if necessary The theatre sister hands instruments to the surgeon from his right and takes instruments from him on his left A notice " silence " is prominent in the operating theatre, and Chevalier Jackson indicates his wants by holding out his hand or raising a finger, though as a matter of fact he is usually anticipated by his assistants or the theatre sister The "silence" notice, he pointed out to me, is necessary because he works without general anæsthetics, if talking were going on the patient might be worried or get excited In chronic cases he always begins with a very slight procedure The patient is brought down to the operating theatre, but on the first day only his mouth is looked at, next day only his throat, and so on until the patient's confidence has been gained, then the surgeon goes on until the bronchoscope or esophagoscope is passed The first time or two, an injection of morphia and atropine may be given and the throat sprayed with cocaine, but later no anæsthetic or sedative of any kind is used. In a patient, for instance, with stenosis of the œsophagus (as seems common in America from swallowing lye, a cleansing preparation of sodium peroxide which appears to be used in every kitchen there), three or four hundred consecutive treatments may be necessary first a thread is passed, and then very gradually the stenosis is dilated Cases of foreign body constitute only 2 per cent of the whole of Dr Jackson's cases, and the examination of so many bronchial, pulmonary and esophageal cases can only be done under local or no anæsthesia—it would be impossible to do it under general anæsthesia The necessary skill has been attained by Dr Jackson by constant practice, I am told that he used to practise passing the broncho-

scope on india-rubber dummies in the evenings in his study, just as a lesser mortal might practise billiard shots. As I was leaving his clinic, Dr. Jackson asked me in what boat I was leaving America, and when I went on board a week later there was a registered letter from Philadelphia, containing detailed notes of all the cases I had seen, while a fortnight after I got to England there arrived another letter from him, giving further details of the most interesting cases of the group

THE MAYO CLINIC

The true founder of the Mayo Clinic was William Worrell Mayo, the father of the brothers Will and Charles Mayo W W Mayo was a man of remarkable character, who was born at Eccles, in Lancashire, and went out to the United States at the age of 26 He graduated M D at the University of Missouri in 1854, and after an adventurous life in Minnesota settled in the little town of Rochester There he became the leading surgeon and the mayor, and when the Sisters of the Order of St Francis built a small hospital, St Mary's, in 1889, they asked him to take charge of it W W Mayo lived to a ripe old age, and his sons, whom he had trained to be skilful surgeons with high standards, gradually relieved him of his surgical work William Mayo proved to be an organizing genius as well, and the growth of the Mayo Clinic has been coincident with the growth of modern surgery As it became evident that the modern surgeon was more and more dependent, in order to treat patients correctly, on the special information possessed by fellow-practitioners, the Mayo brothers gathered around them a picked group of men skilled in all the various departments of medicine and surgery and provided them with the finest equipment obtainable One or other of the brothers constantly travelled round the world, studying every new medical development Thus St Mary's Hospital

grew into the great hospital of 850 beds of to-day, associated with the diagnostic clinic and with a group of subsidiary hospitals—the Colonial Hospital, which accommodates some 250 patients and in which most of the emergency cases are handled, the Worrell Hospital, with over 200 beds, for the departments of eye, ear, nose and throat, neurological surgery and dermatology, the Curie Hospital, for the treatment of patients by X-rays and radium, and the Kahler Hospital, with 205 beds for medical and surgical patients—

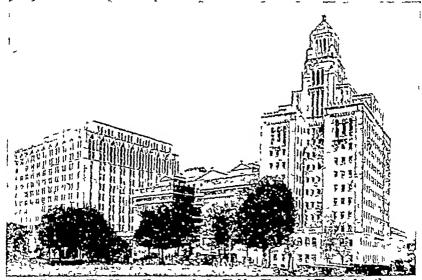


Fig 2—The Mayo Clinic, with the Kahler Hotel and Hospital in the background

it comprises the upper five stories of the Kahler Hotel, and in the lower stories of the hotel are convalescent patients and ordinary hotel visitors. Altogether there are about 1,600 beds in the different hospitals. Last year over 70,000 patients passed through the Clinic, and I was told that on one day recently there were 794 patients, a record number. All the hospitals are connected with the Clinic by subways, beautifully lit and well warmed

In the different hospitals the operating theatres are grouped in pairs with the sterilizing rooms between

AMERICAN MEDICAL IMPRESSIONS

them, and the surgeon walks from one theatre to the next, where he finds the patient ready, and no time is lost. A visiting doctor is given at the office a list of the operations of the day and is shown to a waiting room, where a series of lights on the wall indicate which operation is being performed and in which theatre. He checks this from his list, and may sit comfortably reading his newspaper until he is notified of the particular operation, or the series of operations, in which he is interested.

It must be understood that all the hospitals in Rochester are private institutions, that is to say, nursing homes rather than hospitals in the English meaning of the word. There are 165 doctors, all salaried full-time men, on the staff of the Clinic and its associated hospitals, and in addition there are 250 stipend-drawing Fellows of the Mayo Foundation.

The Mayo Foundation for Medical Education and Research was founded in 1915 by the brothers William and Charles Mayo, and it is supported by the income of the Mayo Foundation Fund of rather over 2,000,000 dollars, and in addition, since 1919, by the income of the Endowment Fund of the Mayo Clinic, which is now over 8,000,000 dollars. In 1917 the funds and income of the Foundation were transferred to the Regents of the University of Minnesota, Minneapolis, so that the Foundation became an integral part of the University. The Institute of Experimental Medicine, situated a few miles from Rochester, is also part of the Foundation

The Mayo Foundation Fellowships are intended to provide opportunities for selected graduates of medicine who are prepared to devote three or more years to fit themselves in the science of some special field or either the basic or clinical medical sciences. The Foundation does not provide any short cramming courses, but endeavours to maintain the work on a true

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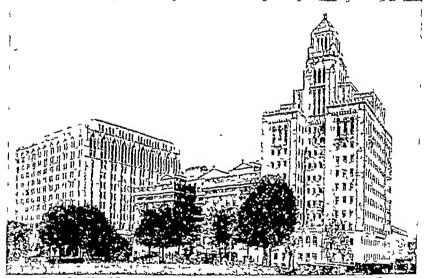


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In the different hospitals the operating theatres are grouped in pairs with the sterilizing rooms between ing of nineteen stories, but it gets more and more oriental as its tall yellow tower climbs 300 feet into the sky At the top, a carillon of 23 bells (cast at Croydon) chimes the hours from eight in the morning till nine at night, and when dusk falls red light on the topmost pinnacle of the tower warns aircraft away, and incidentally lets the world know that the Mayo Clinic is ready for work night and day Special trains, with special doors so that a stretcher case can be easily unloaded, bring the patients to the hospital, and in the Pullman cars notices are posted up asking patients not to discuss their ailments with one another, there are even aeroplane services to bring patients to Rochester, and an air-port has been provided for them The basement of the Clinic is like a factory, with whirring wheels, an endless chain of lifts going up to the different floors, room after room of card indexes, a marvellous arrangement of pneumatic chutes (the invention of Dr Plummer) for conveying case-histories from the Clinic to the various hospitals, and also to bring down the case-histories and other details from the diagnostic sections in the upper stories of the Clinic to the business office down below

When a patient comes to the Mayo Clinic (70 per cent of them come from neighbouring States and 30 per cent from other parts of the world—a large proportion from Canada and South America), he walks up the marble steps into the large and handsome waiting hall He looks round with admiration at the marble floors, the panelled walls, the bronze doors, and inhales the atmosphere of opulent efficiency. He is interviewed by a clerk, who takes down his name and address and other particulars, including income, and is then sent to one of the 14 diagnostic sections. Here his case-history is taken and he may be sent round the Clinic for the various examinations which are necessary, such as blood examinations, bacteriological

university standard Fellows who do not show themselves able to carry on original research are not recommended for re-appointment. The Fellows are chosen from a very large number of applicants—from 1,200 to 1,500 each year—and must be graduates of high-grade medical schools and have held a resident hospital appointment. Their average age is 27, and unless for some exceptional reason, Fellows over the age of 35 are not appointed. Of the 250 Fellows, five-sevenths come from Canada and the United States. About one-third of them are married, and about one-sixth get married during their Fellowship. Nearly all Fellows go eventually to university appointments or into clinical groups when they leave Rochester, only sixteen individuals out of over 500 past Fellows have gone into general practice, and 70 per cent. are at present in teaching institutions.

There is an open meeting in the Clinic every week, at which papers are read and cases discussed, and there are bi-weekly informal "seminars" of the different departments Every Wednesday night there is a general (closed) staff meeting to discuss the cases and pathological examinations of the week The history of the case is read out, the surgeon is asked for an explanation of why he did the operation, what he found present at the operation, and so on, and Dr Robertson, the pathologist, gives expression to what I am told are very pointed opinions of the results of his pathological examinations An immediate pathological examination is made of the specimens removed from every case operated upon, and I was told that in no fewer than $6\frac{1}{2}$ per cent of the cases the pathologist corrected or changed either diagnosis, prognosis, or treatment In one-half per cent of the cases the pathologist found disease to be present that the clinician had not known about

The Clinic begins as a typical American office build-

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Clinic charges patients 10 per cent of their income for a major operation, but that is not strictly adhered to and the fee is graduated according to the importance of the operation and other treatment and the ability of the patient to pay I found that the fees at the Mayo Clinic were on the whole lower than those charged by leading surgeons in Chicago and New York The charge of "commercialized medicine" is sometimes levelled at the Clinic, I found no evidence that there was any truth in this charge—in fact,

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Fig. 3 —The Business Office Record of the Mayo Clinic

the opposite seemed to be the case "organized" medicine, certainly, but not "commercialized". The doctor who is in charge of the patient has nothing to do with the fixing of the actual fee, this is done by the business office staff, who have their own report and the report by the doctor, which contains a list of all the examinations the patient has undergone. A note is made by the doctor as to whether the patient appears to be rich, well-to-do, of moderate means, poor, a

examinations, X-ray, and examinations by specialists, such as eye, ear, nose and throat, neurological, etc. He may be treated as a walking patient and live in one of the hotels or boarding-houses of the town. His diet may be regulated by the Diet Kitchen or he may be sent for treatment into one or other of the hospitals, depending partly on the nature of his case and partly on the hospital fees which he is able to pay. After all the requisite examinations have been completed he is interviewed by the head of the diagnostic section to which he had first been allotted, and the nature of his case and the necessary treatment is explained. If an operation is necessary he is told its nature and what its risks may be. I was much struck by the use made of statistics in this respect. A patient was told, for example, that at his age there was a survival rate of 85 per cent for this particular operation, but that he was considered a good subject and he was advised to take the risk

When a patient arrives a letter is sent to his doctor at home to notify him of the patient's arrival at the Clinic, a second letter is sent giving a full account of the results of the examination of the patient, and a third letter is sent to the doctor if an operation has been performed on the patient, giving the results of the operation. This is done whether the patient has been sent directly by his doctor or whether he has come on his own account—every patient is treated as if he had actually been sent by his doctor to the Clinic. The organization of this part of the clinical work, and the elaborate indexing and cross-indexing that is carried out for every case, is one of the most striking features of the Clinic. Sixty-five girls are engaged on indexing alone.

One subject which practitioners on this side of the Atlantic always seem to ask about the Mayo Clinic is the question of fees They have heard that the Mayo

Paralysis in Children.

By R G GORDON, MD, DSo, FRC.P.E Physician to the Bath, Somerset and Wiltshire Orthopædic Hospital

HE occurrence of paralyses in children is relatively common, but there is a good deal of confusion in the minds of many people about their nature and the possibilities of treatment subject is a large and difficult one and is complicated by many considerations, nor is the literature very helpful since it is scattered and frequently con-So far as treatment is concerned, by far tradictory the most important factor is whether the child is mentally defective or not, since in every form of paralysis it is necessary to have the full co-operation of the child if any real progress is to be made ment must take the form of physiotherapy and reeducation since operative procedures, however theoretically admirable, can only be really useful as a late and possibly last resort since every competent orthopædist will agree that operations which interfere with muscle. bone or nerve during the child's period of maximum growth are only to be undertaken with great caution

The only way to deal with the subject in a short article is to tabulate the possibilities with which we may meet and discuss each

First as to causes—these may be —

- (1) Pre-natal (a) Failure of part of the nervous system to develop properly (non-progressive)
 - (b) Some intra-uterine inflammatory or degenerative process the nature of which is not at present understood (usually non-progressive, rarely progressive)

charity case, or a case for which no charge should be made (1 e a doctor or a minister of religion, or one of their family), and also (1, 2, 3, 4) the amount of trouble he has had to take over the examination Many of the cases are treated as charity cases, but it must be remembered that the Mayo Clinic, with its associated hospitals, is not a charitable institution, but a private organization and does not pretend to be anything else After a final examination of a patient is made, he is given a card to give to the business office where the fees are paid—I was told, however, that an average of 50 patients a day never get to the business office at all, but walk past it! These patients are all written to, but no patient in the history of the Clinic has ever been compelled to pay fees by a lawsuit, nor has anyone ever been refused treatment for lack of the ability to pay

CONCLUSION

These, then, are a few of the high peaks of American medicine, though I was sorry to have been unable on this occasion to visit Johns Hopkins at Baltimore, Boston or Cleveland The surgical work I saw was good, though no better than ours, but better organized, better presented, better indexed There are, however, 120,000 doctors in the United States, many of whom graduated from medical schools which have been deservedly shut down by the force of public opinion Even in Chicago, the home of both the American Medical Association and the American College of Surgeons, there are over 1,000 doctors whom the local medical society will not admit as members It cannot be pretended, therefore, that the average American practi-tioner is of the calibre of the average practitioner in Britain or even of most other European countries But with the encouragement of the high standards indicated in this article, medicine in America is obviously in the ascendant

PARALYSIS IN CHILDREN

Let us consider these in relation to our three previous

headings

- (A) Congenital lesions, i.e. failure of development or intra-uterine disease, the distinction between which is difficult and of no great clinical importance
 - (B) Injury
 - (C) Infection

CONGENITAL AFFECTIONS

- (1) Cortex—(a) If the congenital affection is extensive then there will be general mental deficiency which may or may not be accompanied by motor disabilities. In this case any treatment of the paralysis is likely to be very disappointing since the child is more or less incapable of co-operation.
- (b) If the motor tract, ie the pyramidal system, is principally involved we have a condition of cerebral diplogia or Little's disease This results in a weakness and rigidity of all four limbs, the legs being worse than the arms This is often associated with athetotic movements-typical squirming, slow, entirely involuntary movements most noticeable in limbs, lips and tongue, probably due to involvement of the caudate nucleus and putamen, which prevents their normal control of the globus pallidus These children are often much more intelligent than they seem however, often classed as defectives principally because they cannot express themselves easily either by speech or writing Much, however, can be done for the more intelligent of these cases by careful and patient training. If they suffer from athetosis their writing will never be any good because of the difficulty they experience in controlling the pen or pencil, but they can learn to type since they can hit the key of the typewriter in between the involuntary excursions of their fingers In one favourable example of a severe diplegic the patient was able to swim a short distance on her back

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- (2) Natal. Injury during the process of birth
 - (a) from tearing (non-progressive),
 - (b) as a result of hæmorrhage (non-progressive).

(3) Post-natal. Infections (usually non-progressive once the acute stage has passed off).

We see, therefore, that in most cases, at any rate of the more common forms of paralysis, the condition is non-progressive and that, therefore, any change is likely to be in the direction of improvement.

Exceptions to this rule are rare and need not be fully discussed here. Examples are .- (1) Certain progressive family paralyses which are relatively rare. Progressive lenticular degeneration, very rarely amyotrophic lateral sclerosis occurs in childhood and is progressive. (2) Relapses in certain infective conditions such as acute poliomyelitis, (but the relapses usually recover) and (more serious when they occur) in encephalitis lethargica. (3) In cases of severe injury to the spinal cord where the more or less isolated cord has recovered certain automatic reflexes these may regress again usually as a result of sepsis These cases are not important since the function has never been of any real use. (4) In certain of the muscular dystrophies, e g pseudo-hypertrophic muscular paralysis which are not true paralyses at all.

The next important question is where in the nervous system do these various factors show their influence. The parts we may consider are —

- (1) Cortex (a) as a whole.
 - (b) motor tract
- (2) Basal ganglia and mid-brain
- (3) Cerebellum
- (4) Spinal cord in complete section.
- (5) Lateral columns of spinal cord.
- (6) Anterior horn cells.
- (7) Pempheral nerves.

PARALYSIS IN CHILDREN

Nystagmus is almost always present, and stuttering is frequent. Treatment may do something by reducation, but tends to be rather disappointing, and these cases do not often survive through adolescence.

INJURY

Injuries are caused to the brain either by severe compression of the head in passage through the birth canal or by the application of forceps. In the vast majority of cases the result is hæmorrhage which will cause laceration or pressure on the nervous tissues. As a matter of fact, however, recent work has shown that many cases of cerebral hæmorrhage at birth are so severe as to be fatal either immediately or in the course of the first few weeks of life, or insufficiently severe to cause marked permanent effects so that there can be no doubt that the importance of hæmorrhage as an etiological factor in the paralysis of children has been exaggerated

Injury to the spinal cord and peripheral nerves is in the majority of cases due to direct tearing in the course of delivery of transverse or breach presentations in which excessive traction is brought to bear so as to place intolerable strain on the delicate and friable nervous structures.

- (1) Cortex (a) Injuries sufficiently severe as to injure the cortex as a whole and result in amentia, and in which the infant survives must be very rare and need not concern us here
- (b) Injuries to the motor tract, on the other hand, are quite common. It is possible in cases where the falx is torn by overriding of the parietal bones for the hæmorrhage from the longitudinal sinus to be symmetrical and involve both motor leg areas or even leg and arm areas. In such cases the resemblance to cerebral diplegia may be very close, but in almost all cases of what should be called double hemiplegia,

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and to ride a horse quietly

- (2) Basal ganglia and mid-brain—There is a type of child, not so uncommon as is sometimes supposed, which has been described as a "frog baby" since the limbs are held abducted and flexed rather in the position of the squatting frog. They are characterized by a "lead pipe" rigidity reminiscent of the rigidity of Parkinson's disease. The reflexes are normal and the muscles on excision show no pathological changes. It is suggested that these cases represent a congenital affection of the corpus striatum or its cortical connections. Treatment is slow but on the whole reasonably successful in producing improvement both in posture and movement.
- (3) Cerebellum —Congenital affections of the cerebellum are relatively common and result in a reeling ataxia with hypotonia of the muscles with special difficulty in maintaining the balance of the trunk on the pelvis and the limbs. There is often nystagmus and dysmetria, that is, difficulty in estimating the distance of an object in reaching for it with the limbs. Treatment by re-education often produces marked improvement by enabling the cortex to correct the ataxia which results from interference with cerebellar control. This is achieved principally by means of visual fixation; but later re-education may be continued with the eyes closed making use of direct reception of muscle and joint sense by the cortex.
- (4) Spinal Cord —When the lateral columns of the cord are affected we find the condition known as Friedreich's ataxia, which is probably congenital, although it may be comparatively late in its appearance. The gait is similar to that of cerebellar affections, and to certain muscular atonias. The diagnostic signs are the characteristic clawfoot and absence of tendon jerks, while slight involvement of the neighbouring pyramidal tracts results in an extensor plantar reflex.

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one side is more affected than the other, and this serves to distinguish one group from the other. Further, as has been seen in the case of diplegia, the legs are worse than the arms, but in double hemiplegia the arms are worse than the legs

Ordinary hemiplegia affecting one side or other of the body is fairly common as a result of difficult labour, especially if this involves instrumental interference Whether the hemiplegia is single or double there will be found weakness and "clasp-knife" rigidity with increase of the tendon reflexes, abolition of the abdominal reflexes, extensor plantar response There may or may not be a certain and clonus. amount of amentia which will, of course, tend to be more pronounced the greater the area of cortex which is destroyed. In those cases whose motor area is not well controlled by the higher cortical centres, that is in the potential epileptics, the still further destruction of controlling fibres and cells as a result of the injury may precipitate epileptic convulsions. Treatment of these cases will be along the lines of re-education in relaxation of rigidity, and use of the weakened limb will depend for its success on the extent of the injury and the care and persistence with which the remedial exercises are carried out Such treatment may have to be continued over years until the maximum improvement has been attained and it becomes possible for the orthopædist to step in to the best advantage with permanent appliances or operations.

(2) Basal ganglia and mid-brain—Injuries to the basal ganglia from rupture of branches of the middle cerebral have been reported and may account for some cases of "congenital" athetosis and chorea, but it is difficult to be certain that these are not cases of arrested development or degenerative changes in utero

⁽⁴⁾ Spinal cord (complete section).—Complete tran-

PARALYSIS IN CHILDREN

section of the spinal cord is a serious injury which may occur from severe traction on the spine in breach Such traumata above the fourth cervical segment are incompatible with life, since all respiratory muscles are paralysed, including the diaphragm Below this level, however, the patient may survive, and after the first shock has passed off will present the picture of complete paralysis and anæsthesia below the lesson with loss of voluntary control of bladder and The latter may, however, come to act automatically, that is to say, they will void themselves only when the pressure of their contents has reached a certain level The isolated cord may also show certain reflex responses which may be very misleading and give rise to false hopes and expectations, especially in the minds of parents When the leg or foot is pinched or pricked it will be drawn up sharply, and, as Head and Riddoch showed, this reaction is often accompanied by sweating and voiding of the bladder, the whole complex reaction being called a mass reflex In course of time, especially in the presence of sepsis, these reflexes may disappear owing to the phenomenon described by Sherrington as the dystrophy of isolation, for the human cord does not easily tolerate dissociation from the higher controlling centres

If the lesion is not too high and bed sores and infection of the bladder can be avoided—no easy task—something may be done by orthopædic appliances to let the patient get about on crutches, but the anæsthetic dystrophic skin does not tolerate such appliances well

(6) Anterior horn cells—When traction is applied to one or more limbs during delivery, the force used may be sufficiently great to exert such strain on the cords of the great plexuses that their cells of origin in the anterior horn are actually avulsed and, of course, completely destroyed. This will naturally result in

one side is more affected than the other, and this serves to distinguish one group from the other. Further, as has been seen in the case of diplegia, the legs are worse than the arms, but in double hemiplegia the arms are worse than the legs

Ordinary hemiplegia affecting one side or other of the body is fairly common as a result of difficult labour, especially if this involves instrumental interference Whether the hemiplegia is single or double there will be found weakness and "clasp-knife" rigidity with increase of the tendon reflexes, abolition of the abdominal reflexes, extensor plantar response There may or may not be a certain and clonus amount of amentia which will, of course, tend to be more pronounced the greater the area of cortex which is destroyed In those cases whose motor area is not well controlled by the higher cortical centres, that is in the potential epileptics, the still further destruction of controlling fibres and cells as a result of the injury may precipitate epileptic convulsions Treatment of these cases will be along the lines of re-education in relaxation of rigidity, and use of the weakened limb will depend for its success on the extent of the injury and the care and persistence with which the remedial exercises are carried out. Such treatment may have to be continued over years until the maximum improvement has been attained and it becomes possible for the orthopædist to step in to the best advantage with permanent apphances or operations.

(2) Basal ganglia and mid-brain.—Injuries to the basal ganglia from rupture of branches of the middle cerebral have been reported and may account for some cases of "congenital" athetosis and chorea, but it is difficult to be certain that these are not cases of arrested development or degenerative changes in intero

(4) Spinal cord (complete section) - Complete tran-

PARALYSIS IN CHILDREN

personality changes which may lead to chronic mischievousness and delinquency. When the motor cortex is involved we may have a single or double hemiplegia, which is only distinguishable from the case of injury by the history, a feature not easily obtained with accuracy either from parents or even medical men

- (2) Basal Ganglia and mid-brain —The basal ganglia are affected by encephalitis lethargica and in progressive lenticular degeneration or Wilson's disease, the pathology of which is by no means clear but is probably toxic. This results in Parkinsonian rigidity and considerable restriction of movement with or without tremor Treatment is not satisfactory, as the extrapyramidal lesions are not so easily corrected by re-education as are those of the pyramidal tract.
- (5) Spinal cord—Complete lesions of the spinal cord are often due to syphilis and may resemble the corresponding lesions due to injury. Sometimes vigorous anti-specific treatment is useful, especially if the lesion is due to vascular involvement leading to a starvation of the nervous tissues rather than to a direct infection of the latter.
- (6) Anterior horn cells—By far the commonest infection of the nervous system in children is of course acute poliomyelitis, the incidence of which is mainly on the anterior horn cells and the extent and disabling effect of which varies so enormously. It is impossible to give a full exposition of the symptomatology and treatment of this condition here, but it may be permissible to lay stress on the enormous importance of initial rest. All cases except the most trivial should be nursed on a Jones's frame for two months from the date of the initial symptoms, and when physiotherapy is started great care must be taken that progress is obtained, for many muscles lose the little power they possess as a result of too early and too

a complete flaccid paralysis of the involved limb and no treatment can hope to restore movement to the muscles supplied by the axons of these cells, the only hope being to outwit the disability by some orthopædic appliance

(7) Peripheral nerves—Similar manipulations of a less severe nature result in the tearing of one or more of the cords. This is commonest when the arm is pulled upon and results in what is known as an Erb's paralysis. The prospects here are much better, for the lesion is less extensive and the resulting paralysis and anæsthesia will, of course, depend on the actual cords affected. If there is not too much scarring, regeneration of nerves is possible since their cells of origin are intact and operation to remove scar tissue and where possible to rejoin severed trunks has a distinct place, while physiotherapy in the form of massage and re-education and electricity when it can be tolerated often brings about results much beyond primary expectations

INFECTIONS

Infections are for the most part post-natal, though syphilis is an important exception to this. Since congenital syphilis tends to prematurity its influence is complex, but masmuch as most of the direct manifestations of the disease appear after birth, it is convenient to consider it with the genuinely post-natal infections. These may attack the linings or meninges of the brain and cord, but unless there is involvement of the structure of the nervous system itself in the form of an encephalitis or myelitis, the result is either death or recovery without residua

(1) Cortex —Where the cortex as a whole is concerned we are dealing with an encephalitis, a condition very frequently fatal, but as exemplified by encephalitis lethargica as it affects children, it may result in

PARALYSIS IN CHILDREN

and pam is diminished

Finally, it is recognized that the proper diagnosis and treatment of these conditions are a difficult and delicate art, in which even the most expert are frequently at a loss. It is hoped that the accompanying tabular arrangement may do something to simplify the problem

Type of lesson	Region of Nervous System affected	"Disease"	Intelligence	Prospects of Treatment
Congenital Affections	Cortex as a whole Motor tract	Amentia Congenital Diplegia (Little's disease)	M.D ? M.D	Very poor Very fair
	Basal ganglia and Mid Brain Cerebellum Spinal cord in	? "Frog baby" Family Ataxia	Fair, often "queer"	Good —
	complete section Spinal cord lateral columns	Friedroich's Ataxy	Good	Poor
	Anterior Horn cells Peripheral nerves		-	_
_			-	_
Injury -	Cortex as a whole (hæmorrhage) Motor Tract (hæmorrhage)	Amentia Epilepsy Hemiplegia, single or double	M.D	Very bad Poor unless slight cases
	Basal ganglia Mid Brain (hæmorrhage)	? Paraplegia ? Some cases of congenital chorea and athetosis	Normal	Fair
	Cerebellum Spmal cord in complete section	Paraplegia.	Normal	None if complete
	(tearing) Spinal cord lateral columns,		-	_
	Anterior Horn cells (avulsion)	Mono or diplegias	Normal	Bad
	Peripheral Nerves (tearing)	Monoplegia	Normal	Poor if all cords of plexus involved Fair if lesion less extensive
	I	710		

vigorous treatment.

(7) Peripheral neuritis.—Peripheral neuritis in children is most commonly due to diphtheria, in which case there is as a rule a clear history of sore throat and often of the discovery of the Klebs-Læffler bacillus. It may occur a few days or several weeks after the throat lesion and usually affects the soft palate first. The motor nerves of the eye, the vagus and phrenic are suspectible, but sometimes all the limbs are paralysed with loss of reflexes and sensory changes. Recovery is as a rule assured in the long run, though it may require persistent and prolonged treatment, and in view of vagal involvement and the possibility of cardiac failure initial rest is most important. Cases of general polynemials probably of streptococcal origin are met with, as are those following typhoid and other infections.

TREATMENT.

As to treatment of these conditions in general, perseverance, patience and discrimination are essential. Physiotherapy and re-education are the chief agencies, for as has been said above operative procedures must not be lightly undertaken when the tissues are actively growing. Care must be taken in spastic and rigid cases not to increase the rigidity by injudicious stimuli in the form of massage and electricity, and it must be remembered that young children are often hurt and frightened by the application of electricity in any form and the loss of the confidence and co-operation of the patient far outweighs any benefit derived from the current. All forms of re-education are helped enormously if they can be carried out in hot water in the form of a large hot pool bath, for in this medium the effects of gravity are overcome, rigid muscles are relaxed, contractions can more easily be reduced

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•	Spinal cord lateral columns	Friedreich's	Good	Poor
	Anterior Horn cells		_	_
	Peripheral nerves		_	
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Type of lesion	Region of Norvous System affected	"Disease"	Intelligence	Prospects of Treatment
Infection -	Cortex as a whole Motor tract	Encephalitis Parkinsonianism Polio encephalitis	Personality changes ? Normal	Poor Fair
	Basal ganglia and Midbrain	Encephalitis Progressive	Personality changes —	Poor
		Lenticular Degeneration		None
	Cerebellum		Normal	None if
	Spinal cord in	Myelitis	Normai	complete
•	complote section Spinal Cord Lateral Columns	-		<u>—</u>
	Anterior horn cells	Acute Poliomyelitis	Normal	Poor to good according to severity
	Peripheral nerves	Neuritis (post- diphtheritic general polyneuritis, etc	Normal	Good

Acute Infections and Suppurations of the Hand and Arm.

By S J H GRIFFITHS, MB, ChB, FRCS

Honorary Assistant Surgeon to Bristol General Hospital, to the

Bristol Royal Hospital for Sick Children, and to Winford

Orthopædic Hospital

ITH the exception perhaps of cartilage, almost any tissue of the body may undergo the process of suppuration. Thus in bones we have osteomyelitis, in joints acute suppurative arthritis, in hair follicles, the common boil and so on Suppuration is the common result of invasion of the tissues by pyogenic organisms These organisms act as foreign bodies, and are very irritant, causing inflammation and exudation Micro-organisms differ from ordinary foreign bodies in possessing a peptonizing property which prevents the exudate from coagulating, at any rate completely This peptonized exudate con-Some are of the opinion that pus may stitutes pus form in the body without organisms It is true that some foreign bodies will produce an exudate and may produce some slight liquefaction of the tissue around, but it is a spurious and not a true pus The common invading organisms are the staphylococcus and strepto-Staphylococci excite a protective barrier of leucocytes, which in their turn form fibroblasts so that the organism with its resultant pus tends to become imprisoned, forming the acute circumscribed abscess Streptococci, on the other hand, excite no such protective barrier, and so the infection rapidly tends to become diffuse and widespread, due to the organisms entering the blood stream In any infection, however

Type of lesion	Rogion of Nervous System affected	"Disease"	Intelligence	Prospects of Treatment
Infection	Cortex as a whole Motor tract Basal ganglia and Midbrain Cerebellum Spinal cord in complete section Spinal Cord Lateral Columns Anterior horn cells Peripheral nerves	Encephalitis Parkinsonianism Polio encephalitis Encephalitis Progressive Lentioular Degeneration Myelitis Acute Poliomyelitis Neuritis (post- diphtheritic general polyneuritis, etc	Personality changes ? Normal ?Personality changes	Poor Fair Poor None None if complete Poor to good according to severity Good

ACUTE INFECTIONS

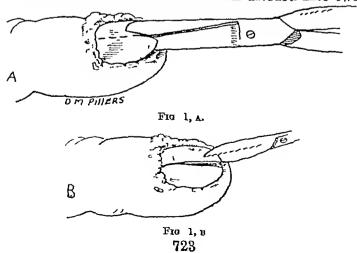
important structures

Whitlow —This is the term which has been very loosely applied to almost any form of suppuration occurring about the fingers, and we know only too well of the devastating results of such infections. It was left to Kanavel to show us that the early method of slashing in the dark under ethyl chloride should be relegated to the days of the barber-surgeon and finds no place in these days of enlightenment. In infections of the hand we now recognize the following clinical entities. (1) Felons, (2) paronychia, (3) sub-cuticular or sub-epithelial infection, (4) tenosynovitis, (5) fascial space infection, (6) lymphangitis, and (7) cellulitis.

Felon—This is suppuration in the pulp of the distal phalanx and, unless relieved, rapidly leads to necrosis of the distal phalanx—The pulp should be freely and

early incised by lateral incisions (Fig. 3, A)

Paronychia — This is an infection occurring at the base of the nail bed, and it generally starts on one side and rapidly spreads to the other. It may be acute or chronic. In acute cases the nail soon becomes floating on a bed of pus, necessitating the removal of the nail. In removing the nail, a stout pair of scissors should be thrust down the middle and the nail divided into two



mild, caused by the streptococcus there is some degree of septicæmia. We shall see that in dealing with acute staphylococcal infection our main line of attack must be on the local condition, whereas in streptococcal infection the improvement of the general condition is the chief objective

The signs of acute infection are the classical four of inflammation swelling, heat, redness and pain. Of the first three there is not much in particular to say, and of the last it will suffice to say that pain brought about by pus is of a throbbing character, which is increased when the part affected is made dependent. This is well shown in the common whitlow, where the patient with a simple infection without the acute formation of pus will swing the arm by the side, but if pus has already formed, he will take care that the arm is kept at a right angle

The pain is directly related to the ability of the tissue infected to expand. Suppuration may occur in loose cellular planes without much pain, but a slight infection of a hair follicle in the nose or external auditory meatures is capable of producing excruciating pain.

The other sign is fluctuation, and true fluctuation when present is a very positive sign. The best demonstration of this sign may be obtained across the belly of a muscle, e.g. the quadriceps extensor muscle of the thigh

The old surgical aphorism of "Where there is pus, let it out" still holds good. On the other hand, it is almost as much a surgical blunder to incise where there is no pus as it is to fail to provide drainage when pus is present. If there is any doubt, it is better to incise, using, of course, strict aseptic precautions, a general anæsthetic and, if in the limbs, a tourniquet. One should dissect for pus and not make a hurried jab in the dark with the point of a lancet. In opening abscesses the incision should be made in the line of

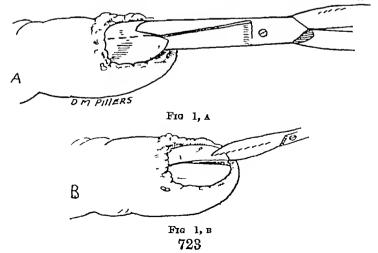
ACUTE INFECTIONS

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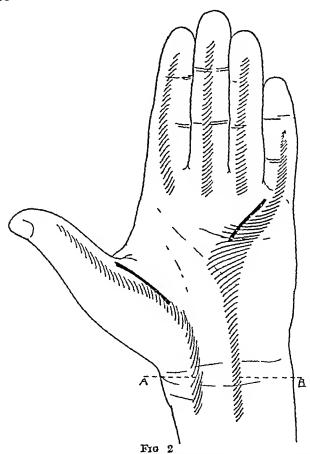
ACUTE INFECTIONS

infected than the extensors To say a word or two of the anatomy of the region, the flexor tendons of the three middle fingers have sheaths as far as the front of the knuckles, but that of the little finger extends into a large sheath in the hand, extending under the annular ligament, and is known as the ulnar bursa (Fig 2, B) That of the thumb extends in like manner above the wrist as the radial bursa (Fig 2, A), and these two bursæ frequently communicate Suppuration in these flexor sheaths is brought about in one of three ways (1) By direct infection, (2) by direct extension of a subcuticular infection which has been left undrained, or (3) by the surgeon slashing in the dark in a sub-cuticular infection, carrying on the point of his lancet infection into the sheath Very quickly there is produced marked constitutional disturbance, exquisite local tenderness and great pain on passive extension of the affected digit This is Morrant Baker's sign and is indicative of tendon sheath infection The infection rapidly spreads, in the case of the thumb to the radial, and in the case of the little finger to the ulnar bursa case of the three middle fingers, the infection spreads into one of the fascial spaces in the palm Of these there are two, the thenar space and the middle palmar space The thenar space drains the thumb and index finger, and the middle palmar space drains the other They communicate with the tendon sheaths Tendon sheath infection should be opened over the point of maximum tenderness and swelling and by lateral incisions on the palmar surface of the finger between the joints (Fig 3, B) The ulnar and radial bursæ should be opened by incisions through the palm in the manner shown on the accompanying diagram (Fig 2)

Thenar space abscess—Here, in the words of Kanavel, there is a ballooning of the thenar eminence, and the thickness of the thumb between the palm and the dorsum is greatly increased. The sign is indicative

halves Each half should then be avulsed towards the centre (Fig 1, A and 1, B)

This prevents damage to the nail bed and a future unsightly nail. After removal of the nail, lateral incisions can be made (Fig. 4, c). The chronic cases are generally seen in neurotic females, and the treatment is frequent painting with silver nitrate, grains 5 to the ounce.



Sub-cuticular or sub-epithelial whitlow —This really consists of a purulent bleb or blister, which should be cut away with sharp scissors

Tenosynovitis —This is suppuration in the tendon sheaths The flexor tendons are far more commonly

ACUTE INFECTIONS

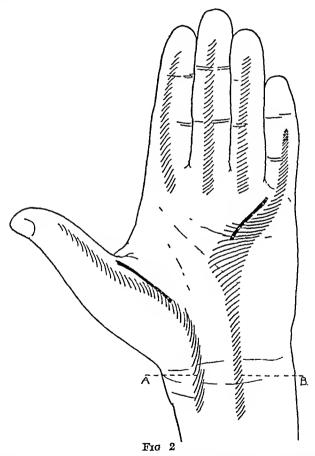
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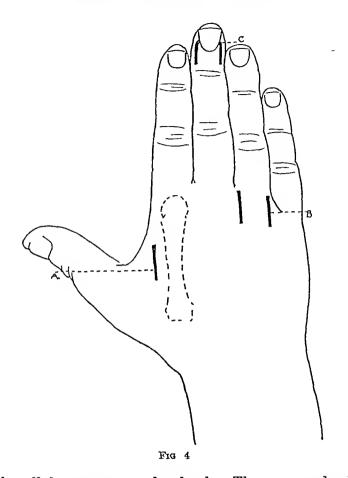
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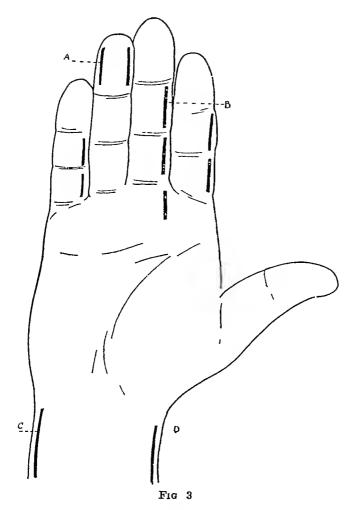
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the cellular tissue or in the glands The incision should be made along the inner axillary wall and the collection of pus reached after the manner described by Hilton "Cut with a lancet through the skin and cellular tissue and fascia of the axilla about half or three-quarters of an inch behind the axillary edge of the great pectoral muscle At that part we can meet with no large blood-vessel There is only a small branch of one of the external thoracic arteries, which sometimes runs along the edge of the axilla, excluding that, which, if wounded, can easily be ligatured or twisted, so far as I can see, we run no other risk Then push a grooved

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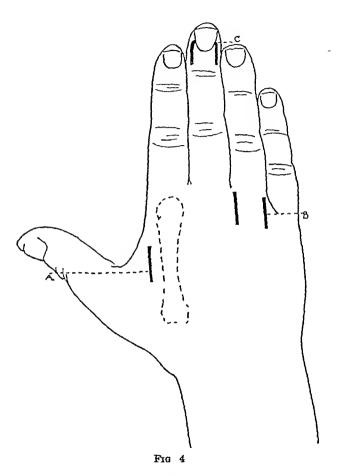


of thenar space infection and calls for drainage of the pus—This can be done by an incision on the dorsum of the hand on the radial side of the index metacarpal and the pus reached by Hilton's method (Fig. 4, A)

Middle Palmar Space—There is swelling of the whole hand, and the space should be opened on the dorsum by incisions in the third and fourth clefts (Fig 4, B) If the infection spreads into the forearm, then lateral incisions should be made deep to the profundus tendons (Fig 3, c and D)

Axillary Abscess -Here the suppuration may be in

ACUTE INFECTIONS



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wounded, can easily be ligatured or twisted, so far a I can see, we run no other risk. Then push a groove

probe or grooved director upwards into the swelling in the axilla, and if you will watch the groove in the probe or director as it is being passed up through the comparatively healthy tissues into the axilla, a little stream of opaque serum or pus will show itself. Take a blunt (not a sharp) instrument, such as a pair of dressing forceps and run the closed blades along the groove in the probe or director into the swelling. Now open the handles, you at the same time open the blades situated within the abscess, and so tear open the abscess. Lastly, by keeping the blades of the forceps open during the withdrawal of the instrument, you leave a lacerated track or canal, communicating with the collection of pus, which will not readily unite, and will permit the easy exit of the matter. In this way you may open an abscess deep in the axilla or in other important parts of the body, without fear of inflicting any injury upon the patient."

In the hand, infection starting from the little finger and half the ring finger passes first to the epicondylar glands and then on to the axilla — All the axillary glands may be enlarged, but the one most liable to suppuration is the apical gland — This is liable to be nipped between the clavicle and the first rib — Therefore it is of importance that in all infections of the hand the limb should be placed at rest

Abscesses ought to be opened at their most depending or lowest part. It is the only way to promote surface coaptation, and it is the first step towards cure. It is also the best preventive against the necessity for daily squeezing an abscess for the purpose of emptying it. This continuous interference with Nature by the surgeon or patient might fairly be called very "meddlesome surgery." There cannot be a doubt that by rubbing the two surfaces of an abscess together once or twice a day we are not only likely to disturb the natural process of adhesion or granulation, but

ACUTE INFECTIONS

almost sure by such friction to induce an inflammatory condition in structures which, for the purpose of repair, ought to be in a comparatively healthy state, and quietly taking their own step towards filling up the whole interior of the abscess in a sound manner

It is meddlesome surgery to apply constant fomentations of boiling water or frequently squeeze the area. We have seen how a protective barrier is formed, and by squeezing all we can hope to do is to break down this barrier and extend the infection. Squeezing should never persist to the point of producing pain. The best dressing, once pus has been found, is a mixture of equal parts of eusol and glycerine. Dressings with this solution should be applied about twice a day, and may be preceded by soaking the whole arm in a water bath containing a drachm of iodine to the pint. The temperature of the water should not be above body heat Boiling water and boiling foments once pus has formed are contra-indicated. While the arm bath is in progress, a Bier's bandage, by producing passive hyperæmia, is very useful

hyperæmia, is very useful

Lymphangitis—This is usually streptococcal and starts from a minute wound, around which a bright reddish blush occurs—This is rapidly followed by a pitting ædema—If occurring in the finger, it rapidly spreads up the arm, first by red streaks—The glands become painfully enlarged—The affected finger can be moved without pain, and in the region of the wound there is no special tenderness—The condition may terminate in one of three following ways—(1) Localized fugitive process, (2) a rapid extension to the deep planes, (3) a rapidly fatal septicæmia

Treatment—Hasty incisions should not be made, but attention paid to the general condition, giving of whole arm baths and the production of passive hyperæmia. We hope that the infection will be arrested in the case of the little finger by the epicondylar glands

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Pain in the Leg.

BY W RUSSELL BRAIN, DM, MRCP

Assistant Physician to the London Hospital, the Hospital for Epilepsy and Paralysis, Maida Vale, and the Royal London Ophthalmic Hospital

PROPOSE in this article to deal with the common medical causes of pain in the leg, discussing the more important practical points in diagnosis and treatment. The subject is important in general practice, and a mistake in diagnosis is apt to have serious consequences.

(1) Sciatic Pain —If the course of the sciatic nerve be visualized from its origin in the fourth and fifth lumbar and first and second sacral segments, it will be clear that it may become involved in many pathological conditions Within the spinal canal, tumours or syphilis may affect the roots The spinal nerves may be compressed by collapse of the vertebral bodies, due to neoplasm, either primary or secondary, osteitis, caries or trauma, by their displacement, especially by subluxation of the fifth lumbar vertebra, or by hyperostosis or infection in spondylitis The lumbo-sacral cord lying in front of the sacro-iliac joint may be involved in disease of the joint, or compressed by neoplastic metastases in the internal iliac glands Within the pelvis an inflamed appendix and diverticulitis are possible sources of infection, while compression may arise from a neoplasm, from the pregnant uterus or from the fætal head during delivery In the buttock the nerve is subject to the trauma of falls or blows, or, as in a patient of mine, repeated bumps from a hard seat while driving a motor van Its posterior relationship to the hip joint renders it liable to be involved secondarily in arthritis of the hip Lastly, it is highly susceptible to interstitial neuritis, which may involve the spinal nerves in the intervertebral foramina or the

and in the case of the other fingers by the apical and the glands of the axilla As soon as there is any sign of infection of the glands, there should be free fomenting and pus formation watched for, but often the infection is so acute that there is little if any affection of the glands, and the infection is passed on rapidly to the general circulation, producing septicæmia It is this condition where the anti-streptococcal serum globulins of scarlet fever produce such dramatic results In severe cases, about 30 c cm should be given intravenously This serum is very potent and the reaction, unless care is taken, may be amazingly severe When giving it intravenously I have found it advisable to dilute it with normal saline, about 1 in 3, but sufficient serum must be given to produce a reaction If the case is not very severe, then 20 c cm may be given intramuscularly and repeated the following day if no improvement I have used this serum in a number of cases, and I have been impressed with the very dramatic results produced It seems that it changes the case from Group 3, 1 e the rapidly fatal septicæmia, to Group 2, 1 e the process at once becomes limited to the affected limb If pus has not actually formed in the glands, then further serum will reduce the infection to Group 1, 1 e the localized fugitive process

In all infections of the hand or arm, rest is of prime importance. It was Carlyle who said, "Rest is a great physician, rest your stomachs, oh, ye dyspeptics, and your brains, oh, ye weary men of business," and I would add—Rest your knives, probes and fingers once you have found pus. It is surprising how quickly an indolent septic finger will heal when the part is placed entirely at rest, either with the patient in bed or the whole arm on a flat splint and kept in a sling.

Pain in the Leg.

By W RUSSELL BRAIN, DM, MRCP

Assistant Physician to the London Hospital, the Hospital for Epilepsy and Paralysis, Maida Vals, and the Royal London Ophthalmic Hospital

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main nerve trunk It follows that, though it may seem a counsel of perfection, no case of sciatic pain has been completely investigated until, in addition to the routine pelvic and rectal examinations, the lumbo-sacral spine has been X-rayed The more thoroughly cases are investigated, the fewer will be relegated to the class of "idiopathic sciatica"

The signs of sciatic neuritis are familiar enough pain in the sciatic distribution, often intensified by laughing and sneezing and on stretching the nerve, which is tender on pressure, flabbiness and slight wasting of the buttock, hamstrings and calf muscles, sometimes of all the muscles of the limb, increase of the knee jerk and diminution or loss of the ankle jerk on the affected side, little if any weakness or sensory loss. As a most important diagnosis lies between sciatic neuritis and sciatic compression, I have tabulated the principal differential points.

	NEURITIS	Compression
Onset Tenderness on pressure Wasting Sensory loss Course	Slight Absent or very slight	Gradual Slight or absent Marked Present Progressive

As regards treatment, I have obtained the best results with X-ray irradiation, even in long-standing cases. Some patients respond well to epidural injection of saline through the sacro-coccygeal foramen, but benefit is very uncertain. The same is true of inflation of the thigh with oxygen. Diathermy is a useful accessory method, and injection of the nerve itself with saline sometimes succeeds.

(2) Anterior Crural Neuritis — This is not uncommon, though less frequently encountered than sciatic neuritis, with which it is often confused and sometimes associated The pain radiates from Scarpa's triangle along the cutaneous distribution of the nerve,

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or the inner and anterior aspects of the thigh in its lower two-thirds and the inner aspect of the leg and foot. The patient lies with the hip flexed to relax the nerve, which is tender on pressure. There is often considerable wasting of the quadriceps, with weakness of flexion of the hip and extension of the knee. Since the quadriceps muscle normally keeps the knee extended, the leg tends to give way on standing. The knee-jerk is diminished or absent, and sensory loss, with the distribution described, is more commonly present than in sciatica. Here again, in addition to the usual treatment of neuritis, X-ray irradiation is useful

- (3) Arthritis of the Hip —This is liable to be confused both with sciatica and with anterior crural neuritis, with either of which it is occasionally associated. In arthritis of the hip, the pain is usually most marked on walking and is intensified by cold, damp weather, it may be referred down the leg, but not as a rule below the knee. The main differential point is the response to passive movement. First rotate the limb longitudinally and then abduct and externally rotate it at the hip with the knee flexed. If these movements are full and cause no pain in the joint, we can exclude arthritis. In all conditions so far described. I have found benefit follow a course of "Transkutan" baths.
 - (4) Polyneuritis —Pain does not always occur in polyneuritis If present, it is bilateral and affects especially the periphery of the limbs. It is described as a peculiarly unpleasant burning or tearing pain, or "like toothache in all my toes," as one patient put it All the signs of polyneuritis are symmetrical and more marked peripherally than proximally. There may be some muscular wasting and weakness, especially of the dorsiflexors of the ankles, with resulting foot-drop. The tendon jerks are diminished or lost, the ankle jerks being affected before the knee jerks. When pain is

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	NEURITIS	COMPRESSION
Onset Tenderness on pressure Wasting Sensory loss Course	Fairly rapid Marked Slight Absent or very slight Stationary or remittent	Gradual Slight or absent Marked Present Progressive

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which fails to respond to other treatment, induced malarial treatment is indicated (6) Severe and in-

tractable pains justify chordotomy

(6) Pain of Vascular Origin—Pain of vascular origin is commoner than is generally recognized and is frequently diagnosed as sciatica (a) Atheroma Intermittent claudication due to pain, usually in the calf, brought on by walking and relieved by rest, is a common and well recognized symptom of atheroma of the arteries of the lower limb There is, however, another kind of pain which may occur in this condition—

An elderly man was sent to me as a case of sciatica While walking home from work he was seized with excruciating pain in the right leg, which became weak so that he could hardly walk. The pain persisted for some days, and was slowly diminishing when I saw him. He had marked generalized arterio-sclerosis. His right femoral pulse was just palpable in the groin. No arterial pulsation could be felt in the leg below this.

The following case is rather similar —

An elderly clergyman fell down his cellar stairs. A few hours later he began to get pain in the right leg below the knee, most marked on the dorsum of the foot between the great toe and the second toe. He was found to have glycosuria, and the pain was attributed to diabetic neuritis. He had no signs of this, but his right femoral pulse was diminished, and no pulsation could be felt in his dorsalis pedis or posterior tibial arteries on this side.

In both of these cases there was arterial blockage consequent upon atheroma, in the second case probably thrombotic, in the former either thrombotic or due to embolism of clot from an atheromatus ulcer. Intermittent claudication and femoral blockage find a cardiac parallel in angina pectoris and coronary thrombosis.

(b) Embolism may cause similar pain, and I found the same physical signs in a woman with auricular fibrillation, who had also been regarded as suffering from sciatica. When an arterial trunk is suddenly obstructed, the limb becomes paler than its fellow and the veins are less prominent. No pulse is felt below the obstruction. There may be muscular weakness and

present, muscular tenderness is conspicuous, and there is usually peripheral blunting of all forms of sensibility. The upper limbs may be affected and sometimes also the cranial nerves. Korsakov's psychosis may complicate polyneuritis, and we may find other clinical evidence of the disorder responsible for the neuritis. Thus, glycosuria is present in diabetes, alcohol may affect the liver, lead the gums, blood, cardio-vascular system and kidneys, arsenic the skin and gastro-intestinal tract. It is now recognized that some of the symptoms of sub-acute combined degeneration are due to an associated polyneuritis, so we may include this as a cause of pain in the legs, which is sometimes present in that disorder

(5) Tabes — Tabes, another cause of bilateral pain in the legs, comes naturally to be considered in the differential diagnosis of polyneuritis. The "lightning pains" of tabes are highly characteristic. Sharp stabbing pains, recurring in bouts and shifting in situation, they are quite different from the pains of polyneuritis Common to both conditions are hypotonia, ataxia, sensory loss and diminution or loss of tendon jerks, but in tabes we find neither muscular wasting nor foot-drop, and the deep tissues are insensitive to pain, not hypersensitive as in neuritis In tabes, moreover, the characteristic pupillary changes and, in the majority of cases, a positive W R in the blood and spinal fluid clinch the diagnosis If the pains of tabes fail to respond to ordinary analgesics combined with antisyphilitic treatment, it is worth while to try the following (1) Intravenous injections of 70 c cm of 15 per cent sodium chloride solution (2) Protein shock, combined with salvarsan—TAB beginning with a dose of 20 millions suspended in N A B solution and injected intravenously (3) X-ray irradiation of the spinal cord (4) Intrathecal injection of salvarsanized serum (5) In progressive tabes

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the tendon reflexes may be diminished for some days Gangrene does not necessarily follow, depending upon the situation of the obstruction, the state of the collateral circulation and the resistance of the patient's tissues

- (c) Aneurysm may follow embolism if the embolish bears organisms of a smouldering virulence. Thus I have seen a patient who came to hospital complaining of pain behind his knee and was found to have popliteal aneurysm and sub-acute infective endocarditis. I have also known popliteal aneurysm follow injury in an elderly man in whom no evidence of syphilis could be found
- (d) Thrombo-angeitis obliterans as a cause of pain in the leg is fairly common in a hospital like the London Hospital, dealing with many Hebrew patients. It commonly begins with pain in one calf on walking. When the patient comes for treatment there is usually some wasting of this calf, some cyanosis of the toes and some reduction of the volume of the arterial pulses in the lower limbs, and often in the upper as well. It is important to note that muscular wasting often follows an impairment of blood supply
- (e) Phlebitis causes little difficulty in diagnosis when the affected vein is superficial, but may be missed when a deep vein is involved, unless careful search is made for ædema. A vascular origin for pain in the leg is thus far from rare, and in any obscure case of pain in a limb the peripheral circulation should be carefully examined.
- (7) Diseases of Bone These must also be borne in mind, especially tumours, syphilitic osteitis, Paget's osteitis and fibrocystic disease X-ray examination will throw light upon such cases
- (8) Hysteria —Hysterical pain, though not common in the leg, is sometimes encountered, usually in women, and often as a sequel of organic disease, such

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as sciatic neuritis or trauma. Here we find the familiar features of psychogenic pain — an exaggerated emotional reaction, a failure to respond to ordinary analgesics, other associated hysterical manifestations, especially hysterical weakness or hyperæsthesia of the painful limb, and, most important, a purpose served by the symptom

(9) Other Causes —In sacro-iliac strain and arthritis pain is sometimes referred into the buttock and back of the thigh. The point of maximal tenderness, however, is over the joint, in which pain may be induced by pressing the iliac crests towards each other, and in which stereoscopic radiograms may show changes. In coccygodynia, also, pain may be referred into the buttocks and down the back of both thighs as far as the knees. In this case the pain is most marked in the coccyx, which is tender on pressure both externally and from within the rectum. Flat foot must not be overlooked as a cause of pain below the knee. Lastly, pain in the leg may be the result of a lesion involving the pain fibres in their course through the central nervous system, as occasionally happens in syringomyelia, disseminated sclerosis and vascular lesions involving the optic thalamus. In such cases physical signs of these disorders will be present.

Simple Local Anæsthesia in the Reduction of Fractures.

By DAVID LEVI, MS, FRCS
Surgical Registrar, Royal National Orthopædic Hospital

HE advent of the motor-car as the possession of the masses of the population has rendered the general practitioner in town or country liable to be faced with a fracture at any time of the day or night Very often he is called upon to deal singlehanded with a broken limb. It is on this account that the method of reducing fractures under local anæsthesia as practised by Bohler in Vienna was forcibly impressed on my mind when I paid a visit to his fracture hospital The method as originated by him is simple, safe and very efficient, and, in his hands, gives excellent results The apparatus required consists of —(1) A quantity of 2 per cent novocaine, ampoules of 20 c cm (2) Two 10 c cm syringes (3) Two or three hollow needles of varying lengths (4) Two pairs of sterile forceps (5) Sterile swabs and iodine

These requisites are generally to be found in the surgery of every practitioner, and by their use in the manner to be described the services of an anæsthetist and an assistant can be entirely dispensed with Another advantage attached to the use of this method is that the fracture is reduced when it is first seen. The reduction takes place within a short time of the receipt of the causative injury, before ædema and the diffusion of the inevitable hæmatoma render the palpation of the bone ends difficult and their consequent exact reposition impossible

The patient should be placed on a couch in the

recumbent position, this is an important precaution, for a person who has recently broken a limb and who has had the site of fracture anæsthetized is very apt to forget his injury. There is a story of a man who fractured his tibia and had the site of fracture rendered painless by an injection of novocaine, he stood on his injured limb in order to talk to the policeman who had taken him to the hospital. The result as far as the broken leg was concerned was disastrous

The technique is very simple The site of maximum tenderness on the surface of the limb, which, as is well known, corresponds with the site of the fracture of the bone, should be noted, and the skin painted with iodine One of the hollow needles should then be grasped with the sterile tissue forceps, and inserted over the tender spot It should then be pushed in until the point of the needle touches the bone A sterile 10 c cm syringe, which has previously been filled with 2 per cent novocame, is attached to the end of the needle protruding from the limb Five c cm of novocaine solution should be injected and the syringe detached. The escape of blood-stained fluid from the needle signifies that its point is in the hæmatoma, and 20 c cm of novocaine should be injected immediately through the needle, which has remained in situ If blood-stained fluid does not appear, then the needle should be withdrawn and re-inserted The amount of novocaine to be injected depends on the size of the bones fractured Twenty c cm is the average amount required. The object of the above procedure is to inject novocaine into the hæmatoma, which is always present to a greater or lesser degree round the ends of a fractured bone Novocame, once in the hæmatoma, rapidly diffuses through its whole substance, and anæsthetizes the bone ends and the adjacent muscles

Under this local anæsthetic most simple fractures can be reduced with the greatest of ease, and splints can

be applied with very little inconvenience to a patient. In impacted fractures, the procedure is not quite so simple, as the hæmatoma tends to be loculated. This loculation is caused by the bone ends which have been jammed against each other. This is notably the case in Colles's fracture, when the lower fragment is crushed into the shaft of the radius. In such instances, the hæmatoma is usually bi-locular, and novocaine should be injected on the flexor as well as on the extensor surface of the bone before disimpaction—which is so essential for good alignment of the fragments—becomes painless.

If the styloid process of the ulna is fractured as well, novocaine must be injected into the hæmatoma round it. The hæmatoma round the radius does not communicate with that round the ulnar styloid. Unless this precaution is taken, pain will be experienced during the course of the manipulation necessary for the reduction of such Colles's fractures. If this type of fracture is the first one in which this method of anæsthesia is attempted, the method will be somewhat unjustly condemned unless the three injections described above are made before any attempt at reduction is resorted to

Otitic Herpes Zoster.

BY HERBERT V O'SHEA, M.D., MCH., D.L.O.

Assistant Surgeon, Metropolitan Ear, Nose and Throat Hospital,
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Department, Children's Hospital, Plaistow

HIS disease was first described as an herpetic inflammation of the geniculate ganglion by J Ramsay Hunt, the publication of whose papers on the subject gave us some definite information as to the nature of the lesion, although the existence of the complaint, with its coincident signs and symptoms, had long been recognized by other observers

The facial nerve is closely connected with the neighbouring cranial nerves—namely, the VIIIth, IXth and Xth, and through its motor fibres with the IIIrd, so that if the VIIth nerve is at all severely diseased, the neighbouring nerves are bound to be affected to a greater or lesser degree. The facial, like the spinal nerves, has a motor and sensory root, with a ganglion on the latter. Both are liable to be attacked by inflammation, giving rise to otitic herpes zoster.

Etrology —Sometimes no apparent cause is evident, but cold may be a causative factor in other cases. The complaint occurs at times in epidemic form, and is usually found in debilitated individuals. The prolonged administration of arsenic and certain diseases of the nervous system have been also regarded as causes. The disease is extremely rare in infants, and is commonest in young adults, while, if it attacks the old and debilitated, the consequences may be very serious

Herpes auricularis may be due to inflammation of the upper cervical posterior root ganglia, through their connection with the posterior auricular nerve, it may

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be also caused by extensive disease of the fifth cranial nerve These are the milder cases and usually clear up, leaving no ill-effects The more serious cases, and those which the aurist has to deal with, are due to inflammation of the geniculate ganglion of the seventh cranial nerve It must be remembered that the disease, although it primarily affects the sensory fibres, may extend to the motor part of the trunk, and then, in addition to sensory, there may be motor symptoms such as paralysis In the still more serious cases, the neighbouring cranial nerves-namely, the vestibular and cochlear divisions of the VIIIth and the IIIrd, or oculomotor, may be affected From a study of the anatomy of the facial nerve and its connections it will be easily understood why symptoms of facial paralysis usually appear before evidence of cochlear or vestibular disease, as there is a much more intimate connection between the sensory and motor roots of the VIIth than between the sensory root of the facial, and the two divisions of the VIIIth, which latter takes place through the small connecting branch, the pars intermedia The trigeminal may also be involved, even in a comparatively mild but extensive infection

While discussing the etiology of this complaint it might be mentioned that some authorities attribute most cases of facial paralysis, which are not due to intracranial or middle ear disease, to an herpetic inflammation of the facial nerve, and entirely rule out the rheumatic feature. I do not agree with this view, as in the majority of cases of facial paralysis—in other words, the condition known as Bell's palsy—the first indication the patient has of the complaint is to wake up one morning, with little or no prodromal symptoms, and find his facial muscles paralysed on one side, whereas the usual thing in herpes is to have initial symptoms such as pain, itching and tingling, followed by the appearance of vesicles, and later paralysis

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Morbid Anatomy -In the first instance, the skin over parts becomes reddened and slightly swollen This 18 followed by the appearance of groups of vesicles The papillæ and their processes which form the base or floor of the vesicles are themselves congested and swollen, and a round-celled infiltration is formed in the deeper layers of the cutis The intravesicular cells, which are derived from the stratum mucosum, disintegrate and form the fluid contents of the blister which is at first clear, and later become turbed as a result of the cell degeneration and an exudation of cells of a leucocytic character from the underlying tissues vesicles rupture eventually, and the contents dry and form a crust, beneath which healing takes place, new epidermis being formed As a rule, very little fibrous tissue is formed, and there is no scarring In other cases in which the disease was very severe, I have seen extensive scars on the face after recovery. They sometimes assume a keloid character

Inflammatory changes occur in the nerve trunk and ganglion, which may be slight and transient. In some of the acute cases, ganglionic hæmorrhages have been observed, while in the cases which assume a chronic condition, the ganglion and fibres have been entirely destroyed and converted into fibrous tissue

Hunt, in his papers, defines distinctly the zoster zone of geniculate ganglion—It is strictly limited to the tympanic membrane, the walls of the external auditory meatus, the concha, tragus, antitragus, helix and antihelix—He says that it rarely extends beyond this area and that the herpetic eruption may affect only a part or the whole of the geniculate zone ¹

Symptoms and Course — There is usually a prodromal period of three or four days, in which the individual is out of sorts, and the skin over the affected area is hot, irritable and tingles Pain is also present, and when, as it usually is, deep in the ear and mastoid

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region, resembles an acute of this media with mastorditis. The resemblance is still more marked, and the diagnosis may be made difficult in cases in which the vesicular eruption is confined to the walls of the external auditory meatus, the swelling of which and the presence of a discharge prevent a proper inspection of the drum membrane. In some cases the appearance of the vesicles is preceded by a swelling of the lymph glands in the affected area. In young children the reaction may be more marked, and there may be malaise, nausea and sickness, accompanied by a slight rise of temperature

The vesicles soon make their appearance on the erythematous patches of skin, at first small and detached from one another, quickly increase in size and coalesce and rupture to form one large scab. By the end of seven or eight days they begin to dry up and get smaller, and eventually disappear altogether, leaving little or no traces of their presence.

The eruption appears to follow the course and distribution of the sensory branches of the facial nerve, and is usually seen over the auricle, external meatus, membrana tympani, tongue, pharynx, tonsil, palate, side of face, and neck. There are, on the other hand, some instances in which the eruption is so mild and transient as to escape detection entirely.

When the motor division is affected by extension of the disease, facial paralysis gradually develops, and in severe cases is complete in the course of a few days. The paralysis may escape detection at first, when there is an extensive eruption on the face, and the patient uses his facial muscles as little as possible to avoid causing himself any extra pain, but it soon becomes noticeable as healing of the sores takes place. It may be very slight, amounting to just a slight lack of tone, or, on the other hand, may be complete

When the auditory nerve is involved in the disease,

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vestibular or cochlear symptoms or both may appear, according to the degree of involvement. Tinnitus and deafness may be present, due to a cochlear affection, while vertigo, nausea, vomiting and nystagmus occur when the vestibular division is attacked. These symptoms may be very slight and transient when due to irritability of the nervous structure, but although the acute vestibular symptoms disappear in time, once the structures of the inner ear are actually diseased they do not respond to the various functional tests, thus showing that irretrievable damage has been done to the inner ear.

The deafness which occurs during the height of the illness is of the mixed type (1) conductive, owing to the inflamed condition of the drum membrane and the obstruction caused by the swelling of the walls of the external auditory meatus, and (2) perceptive, caused through disease of the cochlear apparatus. The ultimate deafness, which is by far of more serious import, is of the nervous type and persists for ever. There may be symptoms of oculo-motor paralysis, such as dilatation of the pupil and ptosis, and even the larynx and certain muscles of the neck may be implicated, for instance, the trapezius and the sternomastoid. These paralyses eventually disappear. It is interesting to note that all the paralytic symptoms and signs are limited to the same side as the diseased nerve. The facial paresis usually clears up in from three to six weeks, but when there is actual paralysis it may take any time up to twelve months, and even then may not completely disappear.

Complications and sequelæ—In addition to those already mentioned—namely, deafness, paralysis, etc—the local lesions may become infected by pyogenic microorganisms and leave nasty scars after they have healed They may even assume a keloid character—In old people, neuralgia may persist for some time afterwards

and undermine their health considerably

Dragnosis —This is important, as the condition may be mistaken for tympano-mastoid suppuration, and in the absence of the typical vesicles from the auricle and face may be a very difficult matter, especially if there is a slight rise of temperature, which may occur Usually, however, the temperature is more or less normal, and the deep-seated pain in the ear, accompanied by the presence of groups of herpetic vesicles, which may be seen in the meatus and perhaps the drum membrane, is sufficient to clinch the diagnosis. The main point to be remembered when making a diagnosis of herpetic disease, whether occurring externally, such as on the auricle or face, or on the mucous surfaces, the tongue, tonsil or pharynx, is that it is strictly limited to one side of the body

Treatment —With regard to the treatment of this condition, during the acute stage the patient must be kept at rest in bed and sufficiently warm. For the pain, which is sometimes rather severe, sedatives such as phenacetin, aspirin or bromides, should be given, especially when the patient is unable to obtain sleep Anodyne drops for the aural pain are sometimes of use, such as guttæ glycerını acıdı carbolici 5 per cent or guttæ morphinæ acetatis When the vesicles have ruptured, the resulting raw surfaces should be kept protected by a light dressing, having first sprinkled a fine antiseptic powder, such as starch and borax, over them The general health of the patient must be attended to, and during convalescence tonics containing iron, quinine and arsenic should be given For the throat, antiseptic gargles, such as chlorate of potash, may be used In some cases there may be rather severe neuralgia locally, which may be relieved by evaporating lotions or ointments containing an anæsthetic such as In some cases it may be even menthol or cocaine necessary to inject morphia With regard to the

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paralyses, no treatment is possible until things have quieted down, and then massage and suitable electrical treatment will help the case. The following case, which came under my care a short time ago, may be of interest —

I was asked to see Mr X., aged 46, as he had severe pain in and behind his ear and was deaf. When I saw him the patient said that he had been out of sorts for some time, and that the present illness came on after sitting in a picture theatre for a few hours with a draught blowing on the right side of his face

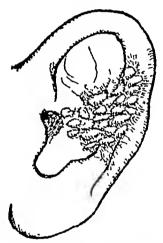


Fig. 1 —Herpes zoster on the auricle

On examination, I found the following condition The right side of the face was covered with opaque vesicles, which extended on to the lower eyelid and around the mouth, chin, and neck eruption was limited to the right side of the face, stopping at the middle line On the auricle was a crop of the same type of vesicles, and the walls of the external auditory meatus and the drum membrane, which latter was red and inflamed, were likewise affected The conjunctive was reddened, and the ulcerated surface of the lower hd was discharging thin pus There were no vesicles or signs of ulceration on the conjunctive or cornea On examining the mouth, blebs and ulcers were seen along the right side of the tongue and pharynx, which made swallowing painful and difficult. The patient experienced sharp pain on turning his head away from the affected side, and complained of deafness, sickness, and slight giddiness at times. His temperature was 102° F There was no mastoid tenderness, but on pressure over the course of the facial nerve and beneath the mastoid tip pain was felt by the patient The symptoms most complained of were

pain in the ear, a feeling of deafness, retching, and being unable to sleep. There was apparently no facial paralysis. I say "apparently," because the entire right side of the face was so covered with vesicles that had ruptured and formed scabs which were so painful, that the patient for some days tried to keep his facial muscles at rest as much as possible

Under treatment the condition gradually cleared up, leaving

the patient very weak and depressed

On examining the patient four weeks after the onset of the disease, when he was convalescent, the following condition was found. Pain had practically disappeared, but the deafness remained. There was slight weakness and lack of tone of the facial muscles on the affected side, hardly amounting to paralysis, especially noticeable when getting the patient to smile. With regard to the deafness, this was of the mixed type, Rinne's test was positive, the drum membrane was dull and retracted with slight traces of the herpes. The external meatus, which had been swollen and inflamed and covered with a discharge, had returned to its normal condition. The throat was normal. Inflation with the eustachian catheter improved the hearing.

When last seen, some seven weeks after the onset, a watch could be heard at a distance of three inches on the affected side, while hearing was normal on the other side. The caloric test showed a normal labyrinth. The facial muscles were apparently normal, though, in the words of the patient, "his face still felt a bit

queer," and he had slight shooting pains at times

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The Smooth Tongue: A Study in Deficiency Disease.

By G ERIC LEWIS, MB, BCH, MRCP

Formerly House Physician, London Hospital, Research Fellow in Medicine, Harvard University, Rochefeller Foundation Travelling Fellow, Assistant in Medicine, Boston City Hospital

HE tongue is a remarkable organ, instructive in a double sense it reveals not only the mind of man, but also his health. As an index of health it may be said to be more truthful than when it acts as an exponent of thought

No attempt can be made at the moment to give a comprehensive survey of the value of the tongue in the diagnosis and prognosis of every type of disease, general and local Certain rare conditions of the tongue, such as Moeller's glossitis, which apparently occur mainly in the diseases to be studied, yet which are not typical of these conditions, must also be excluded

This article deals with the tongue in certain diseases which, as has recently been suggested, are probably due to some deficiency in the diet or in the utilization of an adequate diet. These conditions also tend to be associated with an achylia gastrica, free hydrochloric acid being absent from the gastric juice even after a provocation injection of histamine. Pellagra will be considered as a direct deficiency disease, and examples of diseases due to an indirect or mediate deficiency will be furnished by pernicious anæmia, the secondary achlorhydric anæmia, sprue and possibly certain surgical conditions.

As an illustration of the last group mentioned, a

case may be quoted as typifying the general but unrecorded experience of numerous clinicians —

T W, aged 36 years, following a Finney's pyloroplasty he developed pelvic peritonitis. Acute intestinal obstruction supervened and a jejunostomy was made. Drainage was copious. Three months after the jejunostomy had been performed, the tongue was examined by the present writer. In the main it was normal, but the tip was definitely too red. At the edges to within half an inch of the tip the lingual papille were subnormal in size, and just around the tip the mucosa was quite smooth. It is possible that the loss by drainage had produced a type of deficiency and that the state of the tongue was an early reflection of this.

More than a grain of truth may be contained in the aphorism, "Raw red tongue, raw red gut" Further cases in which surgical interference has induced deficiency and a raw red tongue has supervened, are

quoted by Ungley 2 in a recent paper

Lingual changes in pernicious anæmia were first described by Barclay' in 1851. The sore tongue of his patient was first noticed after a confinement, but the case appears to have been truly an Addisonian and not a puerperal anæmia. The first monograph ever written on pernicious anæmia was by Moeller of Zurich in 1877, and out of 62 cases he remarks on a sore tongue in only 5. About the same period Laache of Christiania only noted the symptom in 4 out of 10 cases.

Hunterian glossitis, as the name implies, was first thoroughly studied by William Hunter³ ⁴ about 1900 He described two main types of change in the tongue the one an acute or subacute inflammation followed by degeneration and atrophy of the mucosa, the other a more chronic process. He also claimed that the changes in the tongue were closely similar to those met with in the mucosa of the stomach, and, less commonly, of the intestines. It is known that a sore tongue may be one of the earliest symptoms of pernicious anæmia. The explanation of this is uncertain, but the fact is illustrated by a series of cases reported by Starr ⁶ These patients suffered relapses due to an insufficient liver intake and

THE SMOOTH TONGUE

the glossitis returned even though the red count did not fall below 3 4 millions

The discoverers of the modern liver therapy of pernicious anæmia claim that after a few months of adequate treatment the tongue returns to normal Thus suggests that the absence of some effective factor contained in liver may be a cause of the glossitis This point will be discussed later Huston⁵ goes so far as to say that the improvement in the blood can be followed by observing the appearance of the tongue Cases with complete atrophy, however, show no improvement in this respect Heath, considers that actual regeneration of the lingual papillæ may occur under treatment by a liver diet Isaacs, Sturgis and Smithio do not, however, regard liver as entirely specific for this symptom They report a few cases in which a mild glossitis occurred during a remission, and they give pictures contrasting the atrophic smoothness of the tongue of pernicious anæmia with the discrete papillary covering of the normal tongue

That type of anæmia of pregnancy which resembles pernicious anæmia may show a smooth tongue, and also achlorhydria in some cases, but detailed case records are not plentiful. For example, in many cases, even if achlorhydria is recorded, the state of the tongue is not mentioned, or else merely referred to as "coated". Of a series of 18 cases quoted by Larrabee, 11 8 were of the pernicious anæmia type, and in only one of these was the state of the tongue mentioned. It was described as being smooth, with red patches about its edge

Many cases of secondary anæmia of a chlorotic type have been reported, 12, 22 especially in middle-aged women, in which there is an achlorhydria persistent even after a histamine injection. Of these patients a fairly high percentage show a type of papillary atrophy in the tongue indistinguishable from the

Hunterian glossitis of pernicious anæmia

In the past eight months the writer has seen 6 such cases, all women over forty-five years, all with achlor-hydria and all with smooth tongues. In these cases the blood picture is much improved by very large doses of iron. 13 for example, 6 grams of iron and ammonium outputs many harmonium. citrate may be given daily The achlorhydria is, how-ever, persistent, and no regeneration of lingual papillæ has been observed In this syndrome, then, the association of a smooth tongue and achlorhydria can again be noted It seems possible, from extensive studies by Minot and Mettier¹⁴ that the fundamental lesion is an iron-deficiency, perhaps conditioned by the achlorhydria

Certain secondary anæmias frankly due to undernutrition have recently been studied by Keefer and others^{15, 16} in China Their work also illustrates the connection between lingual atrophy, anæmia, achlorhydria, and deficiencies in nutrition. In two of Keefer's cases diarrhea was persistent and this probably played a large part in creating a deficiency due to inadequate absorption These cases were treated with both liver and iron and, after recovery, the tongue, formerly atrophic, regenerated its papillæ and became normal in appearance. The achlorhydria was, however, persistent. The recovery of the tongue in these cases treated with liver and iron is in contrast to the persistent smoothness in the cases of secondary achlorhydric anæmia already mentioned treated with large doses of 1ron alone

In another recently-described anæmic state, the Plummer-Vinson syndrome, the tongue is smooth, ¹² and here, too, it is possible that there may be some alimentary derangement, as shown by the dysphagia On the other hand, it is also possible that this symptom is purely of nervous origin

Turning to what is, perhaps, less debatable

THE SMOOTH TONGUE

ground, the disease sprue affords a further illustration of the relationships between the smooth tongue, anæmia, achlorhydria, and deficiencies of diet, whether direct or due to imperfect digestion. The best and most recent description of the morbid anatomy of sprue has been presented by Mackie and Fairley, '7 who performed eight autopsies. They found the tongue wasted and the surface glazed and atrophic. This latter condition was usually associated with disappearance of the lingual papillæ. The gastric mucosa was not degenerate, but although histology reveals no abnormality in the lining and chemical analysis, no gross change in the secretion of the stomach, biological test does show the absence of some factor in the gastric juice in some cases of sprue, as will be mentioned later. And in this connection it may be remarked that liver therapy has usually a markedly beneficial effect on cases with a pernicious anæmia type of blood.

That it is not the mere absence of free hydrochloric acid or pepsin or rennin from the gastric juice which is important, may also be illustrated by the mention of reported cases of genuine pernicious anæmia which had a smooth tongue and yet a gastric juice normal or nearly normal to the usual tests 2, 24, 25

Despite certain schools of thought, it is now generally held that pellagra is, directly, a deficiency disease and here, too, alimentary disturbances are frequent and the gastric acidity, though not absent completely, tends to be low. The tongue is usually raw and red in appearance, often swollen, and with several small ulcers near the tips and edges. The concomitant diarrhæa is also noteworthy. There may be as many as 6 or more motions a day for a whole year, as in a case recently published by Cabot.

While a smooth tongue is most frequently seen accompanied by achlorhydria, and especially in some types of deficiency disease, the reverse does not hold,

and there is no general agreement as to the cause of the lingual atrophy in any of the conditions considered. In the case of pernicious anæmia, the view that the glossitis is a trophic lesion due to nervous dysfunction is often held, but the evidence for this is scanty. It is of more interest to attempt to explain the smooth tongue on the lines of a deficiency such as occurs in all these syndromes. It is possible, for example, that the presence or absence of that factor in normal gastric juice which, when incubated with beef muscle leads to a mixture effective in inducing a remission in pernicious anæmia, is may condition the state of the tongue

But here, again, clinical experimental evidence obtained by Castle, Townsend and Heath²⁰ points to no definite conclusions, as the following facts will show

One case of sprue with a blood indistinguishable from pernicious anæmia had a normal tongue. The gastric juice of this patient contained a normal amount of free hydrochloric acid, pepsin, and rennin. Yet when this juice was incubated with 200 grams of beef muscle at pH 7 and fed to a typical case of pernicious anæmia, no remission was induced. Subsequently a reticulocyte response was obtained in the pernicious anæmia patient by the feeding of a digestion mixture only dissimilar in that gastric juice from a normal person was used. The absence, therefore, of the "effective factor" did not entail lingual atrophy in this case.

But, though the causation of the smooth tongue in these states of deficiency is still uncertain, the value of the tongue as a "constitutional index" remains unchanged. The present work on these conditions tends to revive interest in a subject studied by Hippocrates, our knowledge of which is, however still largely empirical

THE SMOOTH TONGUE

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Practical Notes.

The Treatment of Exophthalmic Goitre

In summarizing his five years' experience of the surgery of Graves' disease, Rendle Short states that at the commencement of this period an interval of one year from the onset of symptoms, during which medical and X-ray treatments were tried, seemed to be advisable before recommending operation, but recently, as the result of experience that operation can be safely performed with practical certainty of benefit, surgical treatment has been offered to patients at a much earlier date Out of 52 patients operated upon during five years for Graves' disease or for toxic adenoma, four died in hospital All cases of toxic goitre should be operated upon and all cases of classical exophthalmic goitre after a year's duration, unless mentally deranged Herapath, in a paper read at the same meeting, confesses that five years ago he considered that the operative treatment of Graves' disease was barely justifiable and that the medical treatment was most disappointing, but after watching Rendle Short's cases he now concludes that in early Graves' disease six months should be given to medical treatment, and that then in the absence of improvement operation should be seriously considered When auricular fibrillation has supervened, operation is the only means of removing the causal factor Operation should be performed directly an adenoma becomes toxic -(Bristol Medico-Chirurgical Journal, 1930, xlvn, 185-192, 193-6)

The Treatment of Hyperthyroidism

L Bérard and R Peycelon review the various clinical forms of hyperthyroidism and come to the conclusion that all goitres have a common origin. In hypertrophic goitres the treatment of choice, in their opinion, is the administration of iodine in small doses—five to twenty-five minims per day In Basedow's disease the treatment at first should be medical, hygienic and dietetic, and when the basal metabolism is not more than 25 per cent above normal, medical treatment may cure or at least greatly improve the condition When, however, the basal metabolism is over 80 per cent above normal, surgical treatment is indicated Treatment by X-rays or radium should, in their opinion, be restricted to those cases which are definitely inoperable, in all other cases surgical treatment is preferable, more rapid and more It should be carried out in association with the attending physician, and the basal metabolism carefully measured and watched The best results are obtained by subtotal thyroidectomy, and the authors prefer local anæsthesia -(Paris médical, November 1, 1930, xx, 379)

Hyperthyroidism in the Old without signs of Goitre

Freund and Cooksley record five cases of this condition in patients between the ages of 50 and 75 years, and conclude that primary hyperthyroidism is common in elderly persons without visible or palpable goitre or the usual signs of exophthalmic

goitre, the patients more often presenting symptoms referable to the gastro-intestinal tract as their initial complaint. The administration of iodine is recommended for vomiting, which in one case had persisted for four weeks, but subtotal thyroidectomy is often necessary and the results very satisfactory—(Journal of the American Medical Association, June 14, 1930, xciv, 1891)

The Larynx in the Surgery of the Thyroid Gland

M Nordland points out that although the larynx is usually considered in the domain of the laryngologist, the surgeon doing work upon the thyroid should be thoroughly familiar with the anatomy of the larynx, for such knowledge will assist him to determine more accurately pre-operative affection of the larynx, and will enable him better to avoid operative injury to the larynx In the surgical treatment of the diseased thyroid gland, injury to the laryngeal nerves occurs probably most often in the attempt to ligate the thyroid arteries and in the control of hæmorrhage within the capsule Very little reference is made in the literature to mjury of the superior laryngeal nerve in thyroid surgery, but the author's dissections indicate that it is easy to injure this nerve in the ligature of the superior thyroid artery, and it is reasonable to conclude that post-operative disturbance of the voice may occur from injury to this nerve Further, because the recurrent laryngeal nerves occur anterior to the inferior thyroid arteries just as frequently on both sides, and penetrate the thyroid space a little farther from the tracheo-esophageal groove that is usually described, extra-fascial ligation of the inferior thyroid artery is best where ligation of this artery is necessary - (Surgery, Gynecology and Obstetrics, 1930, h. 449)

Acute Suppurative Thyroiditis in Children

Mora records two cases in children, aged two and a half and thirteen years, of suppurative inflammation in the isthmus of the thyroid gland, due to himolytic streptococci derived from the throat. Both cases were operated upon, and recovery followed Although this condition is very rare in children, it has been stated to be usually fatal. In forty-one cases of suppurative thyroiditis collected by Robertson, there were nine deaths. Mora points out the importance of a watch on his cases, as hypothyroidism may follow acute inflammations of the thyroid—(American Journal of Diseases of Children, 1930, xl, 500)

The Treatment of Addison's Disease by a Cortical Hormone

The Murhead treatment, which consists in the use of adrenaline, given to the point of tolerance both by the rectum and by hypodermic injection and the administration of adrenal cortex by the mouth, has been employed in approximately ninety cases of Addison's disease at the Mayo Clinic, and has given good

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results in many cases, but has failed in many others, especially in the crises of the disease Rowntree, Kintner and Lymburner report rapid and encouraging results in three cases of Addison's disease from the hypodermic injection of a hormone, prepared by Swingle and Pfiffner of Princeton University, from the cortex of the adrenals and shewn experimentally to restore animals at the point of death, from adrenal insufficiency following adrenalectomy, to complete resuscitation in a few days The patients treated by the cortical hormone, called cortin by Hartman and Brownell, felt better in two days than at any other time in their illness and under any other kind of treatment, and remained in a satisfactory condition as long as the preparation was available The supply of this hormone was somewhat scanty, but more recently samples almost free from adrenaline, suitable for intravenous injection and almost free from irritating effects locally have been obtained. The immediate benefit in crises of the disease is remarkable, but as the disease is chronic the authors throw out the warning that several years must elapse before a final judgment of the value of the treatment of the cortical hormone can be given -(Proceedings of Staff Meetings of the Mayo Clinic, 1930, v, 216)

The Relief of Pain in Coronary Thrombosis

One of the distressing features in coronary thrombosis or cardiac infarction is the failure of amyl nitrite, liquor trinitrini and morphine hypodermically, which relieve the agonising pain of the allied condition angina pectoris. Moore reports a case, with the clinical characters of coronary thrombosis, in which the hypodermic injection of morphine ($\frac{1}{8}$ grain) and hyoscine ($\frac{1}{12}$ grain) did not have any influence on the pain. The intravenous injection of morphine ($\frac{1}{8}$ grain) was followed by a most dramatic effect, the pain disappearing in half a minute and the patient falling asleep—(Lancet, 1930, n, 957)

The Treatment of Abscess of the Lung by Emetine \

Marcel Labbé reports a case of abscess in the left lung which did not improve until emetine was given on the grounds that the patient has been in Algeria and had there contracted an intestinal disorder, and had, at the time of the pulmonary abscess, an enlarged though painless liver, amoebae, however, were not found in the sputum or in the fæces. The improvement after the administration of emetine was rapid both in the patient's general condition and in the size of the abscess cavity as shown by repeated skiagrams. As it may be difficult to demonstrate amoebae, it was thought that they may have been responsible, but Labbé also mentions Brulé's hypothesis that lung abscesses may be due to an unknown pathogenic agent which reacts to emetine in the same way as the Entamoeba histolytica, and also the view that emetine increases the general defensive powers of the body against various infectious—Presse médicale, Paris, July 23, 1930, 993)

priately been contributed by Sir Leonard Rogers, who also supplies the authoritative accounts of leprosy, cholera, plague, and helminthic diseases. The reader will naturally turn with much interest to his summary of the results of the treatment of leprosy by injections of chaulmoogra and hydnocarpus oil preparations, for which, as for other valuable forms of treatment, he is so largely responsible

The Chest Roentgenologically Considered By L R SANTE, M D, F A C P, F A C R Volume XI on a Series of Monographic Atlases, Annals of Roentgenology, edited by J T CASE, M D New York Paul B Hoeber Inc , 1930 Pp xvvi and 561 Illustrations 246 Price 20 dollars

This beautifully illustrated and well-printed monograph contains 876 Röntgen ray studies and 163 clinical illustrations, and is divided into three parts, dealing with the general considerations essential to the interpretation of thoracic radiology, the evidences of morbid changes as they appear under X-ray examination, and a detailed description of each disease from its early stages to its termination, the last section occupying more than half the volume, and beginning with diseases of the larynx and trachea, few of which are shown by radiograms, concludes with a section on in one case for 126 days, and in all cases for at least 40 days. But in no case did it exert any influence, either good or bad, upon the frequency or severity of the seizures, nor was the progress of the myocardial changes altered —(American Journal of the Medical Sciences, 1930, clxxx, 858-364)

The Diagnosis and Treatment of Gastric Syphilis

C Papp contributes some important observations on that often unrecognized condition, gastric syphilis The case reported simulated a juxta-pyloric ulcer both symptomatically and radiologically X-rays following a bismuth meal showed a well-marked deformity of the duodenal cap with great delay in the passage of the meal, indicating a severe degree of pyloric stenosis The blood Wassermann reaction was strongly positive, though no evidence of a primary lesion was discovered. Intensive antiluetic treatment with bismuth and iodide was instituted in view of these findings One month later the condition of the patient was greatly improved, pain had disappeared, appetite had returned and the weight had A radiogram taken at this time showed no irregularities in formation of the duodenal cap and normal passage of the bismuth meal into the duodenum, the stomach being completely emptied after six hours A fortnight later the Wassermann reaction was negative and the patient was discharged from hospital feeling perfectly well Papp concludes from his observations that gastric syphilis has no peculiar symptomatology but simulates other diseases of the stomach, in his case a gastric ulcer -(LaRiforma Medica, September 15, 1930, 1467)

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The Treatment of Children's Diseases with special Formulas and Drugs from Childhood, and a short Diagnostic Summary of each Clinical Picture By Professor Dr F Lust, Director of the Children's Hospital, Karlstuhe Authorized translation of the sixth German edition, with addition by Sandor A Levinsohn, MD London J B Lippincott Co Med 8vo, pp vii and 513 Price 30s

This concise guide to the diagnosis and treatment of children is eminently practical in character, and the second of the two parts of the volume is devoted to an alphabetically arranged description of the drugs and formulas useful for children and directions for the preparation of the foods best suited to infants. Among the more recent recipes are those for almond milk, recommended by Moll

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The Relief of Pain in Coronary Thrombasis.

Tropical Medicine By Sir Leonard Rogers, CIE, MD,
FRS, and Major-General J W D Megaw, CIE, MB,
Director-General, Indian Medical Service Churchill's Empire
Series London J and A Churchill, 1930 Royal 8vo Pp
vii and 536 1 coloured plate and 77 illustrations Price 14s

This work, by two well-known authorities on tropical diseases, does not profess to be a complete source of reference on the subject, such as is needed in a well-equipped medical school and laboratory It is intended to supply the vast majority of medical men in the tropics, who are out of reach of these facilities, with the practical essentials But it is by no means such an elementary guide as the authors' modest preface might suggest The important diseases are grouped in eleven sections, partly according to their causation, such as febrile diseases due to protozoa, to spirocheetes, to bacteria, to diseases due to worms, to errors in diet and heat and light, and partly according to their clinical features. for example, bowel diseases with symptoms of dysentery and diarrhea, and diseases with the most prominent lesions on the surface of the body Though jointly responsible for the contents. each author signs the article he has written Thus, Major-General Megaw gives the accounts of malaria, of spirochetal infections, including rat-bite fever, infectious jaundice, yellow fever and dengue, and of dietetic diseases, including the deficiency diseases Under the heading of dietetic diseases of doubtful or unknown etiology he places beri-beri, for he does not believe that the orthodox definition that it is due to a deficiency of vitamin B has yet been satisfactorily proved to be correct. The important articles on amæbic dysentery and on amæbic hepatitis and liver abscess, which are for convenience separated from each other, have appro-

REVIEWS OF BOOKS

regarded as playing a part in the disease and as being succeeded by hypothyroidism as the disease wanes The indications for the various forms of treatment are set forth and much useful information is provided in this handy volume

Gray's Anatomy, Descriptive and Applied Edited by T JOHNSTON, MB, CHB, Professor of Anatomy m Guy's Hospital Medical School, University of London 24th edition 1,301 illustrations, of which 607 are coloured London Longmans, Green & Co, 1930 Price 42s

IT is 72 years since young Henry Gray, FRS, FRCS, lecturer on anatomy at St George's Hospital, published his "Anatomy, Descriptive and Applied" He was only 31 when the book was published, and when he was 34 and a candidate for the post of assistant surgeon at St George's Hospital he died from confluent smallpox, contracted from a nephew whom he was attending Little dreamed the brilliant young anatomist of the 'fifties that seventy years later his name would be familiarly on the lips of every Englishspeaking medical student, or that his twenty-fourth edition would be edited by a lecturer at Guy's, a pupil of the great Edinburgh anatomists of the later years of the nineteenth century, Turner and Cunningham The present state of this standard work owes, however, almost more to Professor Howden, of Newcastle, than to Gray, for his editorship covered a period of more than twenty-five years, during which time most of the sections were completely rewritten In this new edition the most notable changes are in the section on the central nervous system, which has been rewritten by Dr Johnston in accordance with the recent change of attitude of anatomists towards the nervous system—a re-orientation which is due primarily with embryology has also been largely rewritten Prevention and Treatment of Tuberculosis in the Administrative The section dealing

County of Lancaster Report of the Central Tuberculosis Officer of the Lancashire County Council for 1929 Pp xiv

In this elaborate report, containing many tables and a number of shagrams in connection with cases under various forms of treatment, Dr Lissant Cox shows a most praiseworthy activity The number of new cases of tuberculosis notified is the lowest on record since compulsory notification was instituted in 1912, the death rate from pulmonary tuberculosis, which has declined progressively since 1923, was a little higher in 1929 than in 1928, and the deaths from non-pulmonary tuberculosis were the lowest on record Twelve of the tuberculous dispensaries have been equipped so as to give artificial light treatment, and the results in some forms of non-pulmonary tuberculosis are satisfactory report on 25 cases treated by sanocrysin shows that 14 cases were definitely improved and 11 not affected Among 51 cases treated since 1916 by artificial pneumothorax, a satisfactory collapse was obtained, and in 15 females the left side was collapsed, whereas in the 19 men the right side was collapsed, no explanation of this 763

for infants with severe dyspepsia, and the pudding diet "Moll," a milk-free diet for older infants and young children with alimentary anismia, chronic dyspepsia, tetany, and chronic eczema. In the first part of the work the feeding of infants and children is fully dealt with, the treatment of status lymphaticus is regarded as purely dietetic and consisting in avoidance of over-feeding, especially with milk and fats. In the section on diseases of the new-born there is an account of the transitory or thirst fever between the second and sixth days of extra-uterine life due to lack of water. The short description of "pink disease" is very rich in its synonyms—acrodynia, vegetative neurosis, Swift-Feer's disease, erythrædema polyneuritica. The editor's additions are judicious, brief, and to the point

Asthma and its Treatment By Percy Hall, MRCS, LRCP London William Heinemann (Medical Books), Ltd, 1930 Pp ix and 130 Price 7s 6d

The author, whose previous work on ultra-violet rays in the treatment and cure of disease has reached a fourth edition, here sketches first the causes and symptoms of asthma and then the various forms of treatment that have been employed. Beginning the second and larger part of the book with the sound view that there is not any single specific remedy, the author touches on the influence of general hygiene, vaccines, drugs, psychotherapy, diet, diathermy, and concludes that apart from general hygiene and diet the most valuable form of physiotherapeutic measures is actinotherapy. Irradiation of ultra-violet rays of asthmatic patients should be both general and local, and the best sources of ultra-violet rays for asthmatic patients are the quartz mercury vapour lamp and the tungsten are lamp, the Kromayer type of the former being used for local irradiation of the pharynx and nares

The Treatment of Chronic Arthritis By A H Douthwaite, M D, F R C P, Assistant Physician, Guy's Hospital Modern Treatment Series, 1930 London Jonathan Cape, Ltd, 1930 Crown 8vo Pp 127 Price 5s

DR DOUTHWAITE writes clearly and wisely on the treatment of forms of joint disease which are later described separately in osteo-arthritis, infective arthritis, rheumatoid arthritis and gout. The opening chapter deals with the morbid anatomy of those forms of joint disease which are later described separately in detail. An interesting question is the etiological importance of focal sepsis, as regards osteo-arthritis, the conclusion reached is that it is rarely caused, though it may be aggravated, by sepsis. Rheumatoid arthritis is definitely separated from infective arthritis, though focal infections may be found in patients with rheumatoid arthritis, they accompany and do not necessarily ante-date the joint affection, they are, indeed, just one more feature of the devastating disease, in some instances remission of the joint symptoms is followed by disappearance of the focal infections. No support is given to the view that hypothyroidism is responsible for rheumatoid arthritis, but hyperthyroidism is

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We have received Messrs Evans' annual medical price list, issued this month in a revised and up-to-date form, divided into three sections denoted by different coloured paper. The first section (white paper) contains a therapeutic index, in which the principal preparations are assembled under headings indicating the class of disease for which they are usually prescribed, also pharmaceutical and biological products, chemicals and drugs (in which articles covered by the Dangerous Drugs Regulations and those under Parts I and II of the Poisons Schedule are marked with convenient distinctive marks), and Midgley's wide range of medicated soaps. In the second section (blue paper) are catalogued ampoules, capsules, pills and tablets. In the third section (cream paper) are surgical instruments and medical sundries such as air cushions, lotion jars, obstetric bags and ophthalmic test charts. This publication is more than a mere price list, and Messrs. Evans will send a copy to any practitioner who applies for it

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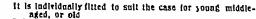
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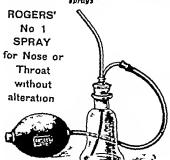
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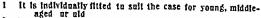
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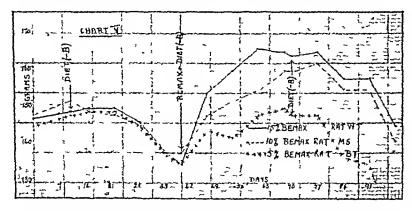


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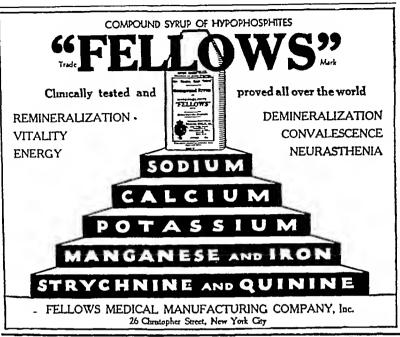
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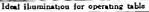


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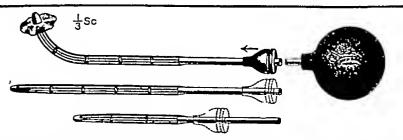
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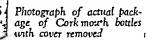
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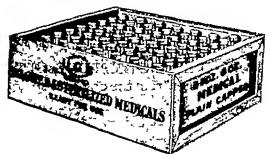




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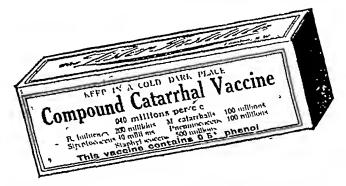
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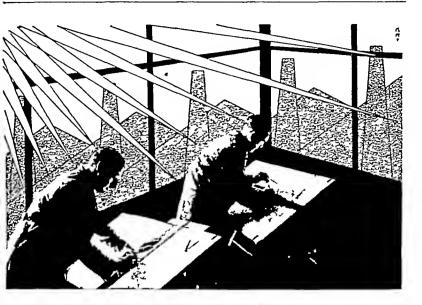
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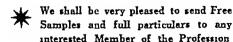
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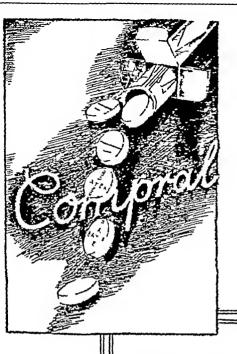
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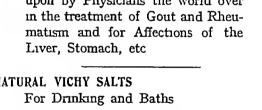
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NATURAL VICHY SALTS VICHY DIGESTIVE PASTILLES Prepared with Natural Vichy Salts

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(In a discussion on "Vinous Tonics.")

"An elderly patient had had one breast removed; a glandular swelling appeared in the neck, nothing to be alarmed about, but, on account of what she had just gone through, I had difficulty in persuading her that, as soon as she recovered strength, the swelling would disappear. I do not make a routine practice of advising wine, but here was a case in which it was distinctly indicated, so I ordered Keystone Burgundy. I have never known this woman anything without complaining—a difficult woman to treat-and I quite expected her to refuse this after a few doses Instead she took it well, said it helped her digestion and improved her appetite; evidently lack of gastrio tone, and with improved eating the swelling quickly disappeared "

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Builds up

in underweight conditions and provides a perfectly balanced, highly nutritive diet for growing children.

TO the problem of the "underweight" child Horlick's Malted Milk provides a convenient solution

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Excellent results obtained by adding Horlick's to the diet of growing children have been strikingly recorded in many thousands of letters written by parents and members of the medical profession

Made from fresh, full-cream cows' milk, selected wheat and malted barley, Horlick's Malted Milk constitutes, in convenient form, a perfectly balanced food—containing fat, proteins, and soluble carbohydrates in correct nutritive ratio. It retains the vitamin content of its ingredients unimpaired during the process of manufacture

Horlick's contains no cane sugar—but a high proportion of valuable malt sugars, quickly assimilable and productive of energy. To ensure perfect assimilation Horlick's is partially pre-digested during manufacture.

In addition to its important body-building qualities, Horlick's has the advantage of being an extremely palatable beverage Most children like the natural flavour of malt and will drink Horlick's with pleasure And Horlick's is now obtainable also in a new Chocolate Flavoured form—identical in constituents with the original Horlick's, but with fine chocolate added to give it a new, appealing flavour

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A supply for clinical trial with full descriptive literature sent free on request A. WANDER, Ltd 184 Queen's Gate London, SW 7

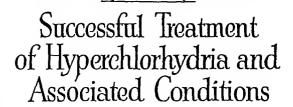
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Acetyl-salicylic acid possesses a notable disadvantage Physicians have proved that it cannot be tolerated by patients suffering with a delicate stomach Consequently, the value of this medicament in the wide field in which it is indicated is very seriously reduced.

"Alasil" completely overcomes this objection. By combining calcium acetyl-salicylate with "Alocol," unfavourable secondary action upon the stomach is prevented. This beneficial influence is undoubtedly due to the presence of "Alocol" (Colloidal Hydroxide of Aluminium), which preparation has brilliantly stood the test of practice in the treatment of hyperacidity and other ill-conditions of the gastric tract.

"Alasil" is therefore a triumph over acetyl-salicylic acid. It enables higher doses to be administered and maintains the patient's system under its influence for a greater length of time. Analgesic, Antipyretic and Sedative, "Alasil" is indicated in all cases where acetyl-salicylic acid has been used heretofore.

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"Alocol" (Colloidal Hydroxide of Aluminium) has proved remarkably successful in the treatment of hyperchlorhydria, gastric ulcer, fermentative dyspepsias with gastro-intestinal flatulence, acid eructation and other symptoms common to gastric disease.

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Patients highly approve the pleasant flavour of "Cristolax,' the complete absence of oiliness and its cleanly form



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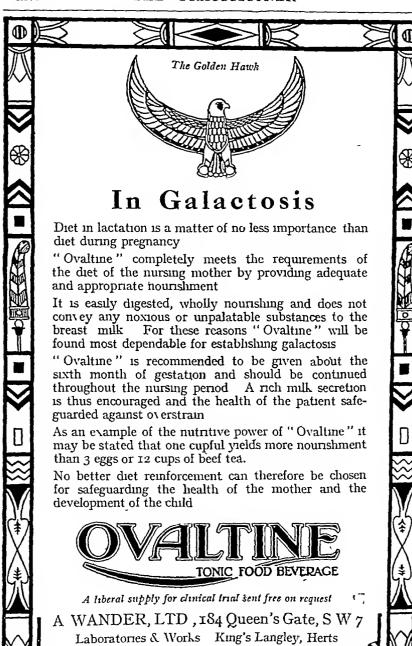
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- 'PAROLEINE' ATOMISER

Simply constructed. Easily sterilised Produces a large volume of finely-divided spray

"'PAROLEINE'" SPRAY COMPOUND

Menthol, gr 5 Chlorbutol, gr 6
'Eucalyptia,' min 15 'Paroleine,' ad fl oz 1

'Paroleine' (for spraying) is a high-quality liquid paraffin Bottles of 1 fl oz and 16 fl oz, 1/ and 8/ each

"'VAPOROLE'" EPHEDRINE SPRAY COMPOUND

Contains Ephedrine, 1 per cent., Menthol, Camphor and Oil of Thyme, of each 2 per cent., in a base of 'Paroleine'

Bottles of 1 fl oz 2/3 each

Prices in London to the Medical Profession



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Gastritis, Gastric and Duodenal Ulcer

That BiSoDoL is a therapeutically sound preparation will be readily appreciated from its formula.

BiSoDoL is a balanced combination of the Sodium and Magnesium bases with Bismuth Subnitrate, Carica Papaya, Malt Diastase, and Mentha Piperita

BiSoDoL supplies a convenient and agreeable product for the treatment of gastro-intestinal conditions associated with hyperacidity It is a valuable preparation for allaying such digestive symptoms as eructations, flatulence, distension and nausea

BiSoDoL is also giving excellent results in the alkaline treatment of gastrius, and of gastric and duodenal ulcer, as well as in the control of cyclic vomiting, and the morning sickness of pregnancy. In the latter the effect of BiSoDoL has been especially noteworthy

BiSoDoL

Samples will be gladly sent to Physicians on request.

BiSoDoL Limited, 12, Chenies Street, London, W.C 1.

OCTOBER

1930

The Modern Treatment of Breast Cancer.

Editorial Introduction.

OR no pathological condition has the conception of surgical treatment undergone such modification within the past few years as for cancer of the breast, and this progress stands primarily to the credit of British investigators From the mutilation of radical excision, the only accepted method of dealing with malignant mammary tumours as recently as five years ago, surgeons have turned their attention to the possibilities of radium, accurately measured and applied, and the following papers on this subject, by five acknowledged leaders in the field, set forth clearly the present-day position The unanimity of opinion therein expressed is striking as regards the potentialities of radium and the methods of its application, although some divergence still is manifest as to the rôle surgery has left to play It is indeed significant of the intensity with which work on radium in cancer is being carried out that the possibility of putting surgery into the background is so frankly admitted, for although the extirpation of the mammary gland and its surroundings is a severe operation, the results, over a quarter of a century, have fully justified its performance, and "No surgeon," as Mr Geoffrey Keynes writes. "will lightly abandon it in favour of any alternative

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The Constipation Syndrome

Whether the symptoms associated with constipation are partly toxemic or entirely due to neuro-muscular disorder, there is no doubt about their reality or their gravely disturbing effect on bodily and mental efficiency

The influence of emotion, acting through the mediation of the sympathetic nervous system, on bodily processes—markedly on those concerned with alimentation and elimination—is reversible, the psychic consequences of discordant activity of the involuntary muscles being no less striking Many vague discomforts and disturbances of health which are often brushed aside as

neuroses, or as consequent on undefined focal infections, are, in fact, brought about by disharmonized or ineffective peristalsis

Thus, we suggest, is explained the undoubted benefit which patients suffering from such disturbances often derive from a morning glass of Eno's "Fruit Salt," taken regularly over a period of a few weeks In addition to—or by reason of-its purity and its complete freedom from such mineral salts as Epsom and Glauber, Eno is pleasant and refreshing to the palate, as well as effec-It has the tive in action further merit of being nonhabit-forming

"The Doctor's Emergency Reminder"

The Proprietors of ENO's "Fruit Salt" will deem it a privilege to send to any member of the Medical Profession a copy of the latest of their series of "Medical Reminders"—with or without a bottle of their preparation as desired "The Doctor's Emergency Reminder" summarises briefly a few points in connection with the treatment of poisoning and various other emergency cases—It is bound in black morocco limp to conform to the style of the previous publications in this series



ENO'S "FRUIT SALT"

stage being the interstitual radiation. The second stage is described as "surface irradiation," that is, the application of radium at a short distance—15 mm from the skin by means of plaques with needles embedded on their surface The plaque is applied daily for twelve to sixteen hours, over a period of two to three weeks The object of the plaque is to provide a uniform irradiation of low intensity over a prolonged period, and so ensure adequate treatment of the skin and subcutaneous tissues up to a depth of 2 or 3 centimetres In selected cases, if necessary, this two-stage treatment is followed or preceded by some form of surgery, if, for example, a residual mass is present at the end of six months, it is excised by diathermy Mr. Duncan Fitzwilliams also follows the two-stage method of irradiation, but with a modification of the interstitial needling He inserts the needles in a gridiron pattern beneath the tumour, and leaves them for five or six days The patient is then given one or two weeks rest, and the needles are re-inserted, with a different arrangement of the gridiron, so that they he between their former situations. He further attaches copper wire, instead of gut, to the needles, which permits of easier withdrawal should they become buried Sir Lenthal Cheatle employs interstitual radiation only, but he emphasizes the probability of a difference in action on the tumour cells between interstitial and surface radiation Further. the cytological study of a case of lip carcinoma, carried out by Dr R J Ludford, affords some data on the comparative effect of radium on normal epithelium and malignant cells These findings show the relative freedom from the effects of radiation of normal epithelium, while the radiations appeared to have a specific action upon the malignant cells Mr Sampson Handley holds the view that about 70 per cent of cases of breast cancer present enlarged axillary glands

procedure"

And yet, although it has by no means been superseded, surgery is yielding priority, for the consensus of opinion is that the results to be expected from radium are as good as those obtained by operation, and perhaps somewhat better. In comparative tests on carcinoma of the skin, for example, Professor Forssell of Stockholm attained success with radium in 69 per cent of cases, as against 65 per cent with operative measures

The change of outlook on the use of radium chiefly concerns the stage of the tumour at which it should be employed. Formerly something of a last hope in moperable cancer, irradiation has now been claimed as the elective treatment as a first stage in the majority of patients

The methods of treatment, as described in the following articles, may be briefly indicated Mr. Geoffrey Keynes relies on "interstitual radiation" alone large number of radium needles, each containing a small amount of radium, are placed in the tissues so as to irradiate the whole growth and a large area round it, an operation which can be performed in about twenty minutes under gas and oxygen anæsthesia, and usually causes the patient little or no disturbance A second series of needles is placed in groups to irradiate the lymphatic areas, 1 e under the pectoralis major muscle, in the axilla, above the clavicle, and in the upper three or four intercostal spaces treatment given to the lymphatic areas is used as a routine, whether glands can be detected or not, for the fact that no glands can be felt is no proof that none are infected. The needles are left in situ for a standard period of seven days, and in the most straightforward cases, he states, no further treatment is required

Mr Stanford Cade, as the result of his experience, adopted the "two-stage" radium treatment—the first

by any agonizing pain, or by the distress nsive discharging ulcer The patients died they died more easily, but they died just the I well remember the period of deep discourhich attended my realization of this sombre idy of the sites of recurrence provided the which can be stated in a very few words time when the axillary glands are infected a large number of cases obtain access also ernal glands which lie within the chest use of the internal mammary artery per cent of cases of breast cancer present ry glands when they first consult a sure seen then that in seventy per cent of ie it is submitted to treatment breast tathoracic disease

ears since I realized this fact, which e conviction that operative treatment e to deal radically with breast cancer then that a combination of operation nal disease with buried radium tubes horacic extensions was the method to-day I am not convinced that this

n made a routine of this policy, and n claim to have rationalized and se of radium as an indispensable on for breast cancer

de operation, before the wound is ligram tube of radium element, platinum, is introduced from the up internal to the vein above the imes to lie just over the lowest of glands. This gland, situated in ingle of the posterior triangle just artery, is the first of the glands of be invaded by breast cancer.

455

GG 2

removal of the breast was an incident in the fulfilment of this requirement Security against direct abdominal invasion through the tissues just below the ensiform cartilage was increased by removing a portion of the anterior layer of the rectus sheath in this situation Removal of all the axillary glands, including the highest or subclavicular glands, in continuity with the breast, first demanded by Gross and Mitchell Banks, remained an essential of the operation, but the extensive removal of skin demanded by Halstead was replaced by the removal of a circle of skin only four or five inches in diameter The diminution in the skin area removed and the increased undermining of the flaps allowed the suturing of the wound without tension and greatly diminished the severe post-operative shock which used to be the rule

After this operation local and axillary recurrence is very rare, especially if a short course of prophylactic X-rays is given to the area when the wound is healed But as the years went on and remote results could be studied it was seen that after all the ultimate results left much to be desired For three years or so all went well The horrible external ulcer, the painful swelling of the arm, the fixed axillary mass and to a large extent the recurrences in the liver and the pelvis were things of the past But at the end of three years one or two nodules appeared at the inner end of the upper intercostal spaces of the affected side, and at about the same time a hard gland made its appearance at the lower and inner angle of the posterior triangle just over the subclavian artery From this time the patient, hitherto so well, went rapidly downhill and died within a few months with signs of a mass in the superior mediastinum, or with signs of pleural deposits on the side of the growth, or on both sides The end was a comparatively merciful and rapid one, and the terminal period of invalidism was a short one, unaccompanied

frequently by any agonizing pain, or by the distress of an offensive discharging ulcer The patients died later, and they died more easily, but they died just the same, and I well remember the period of deep discouragement which attended my realization of this sombre A study of the sites of recurrence provided the explanation, which can be stated in a very few words At about the time when the axillary glands are infected cancer cells in a large number of cases obtain access also to the parasternal glands which lie within the chest along the course of the internal mammary artery About seventy per cent of cases of breast cancer present enlarged axillary glands when they first consult a surgeon It will be seen then that in seventy per cent of cases at the time it is submitted to treatment breast cancer 18 an intrathoracic disease

It is now ten years since I realized this fact, which carried with it the conviction that operative treatment alone is inadequate to deal radically with breast cancer. It appeared to me then that a combination of operation to remove the external disease with buried radium tubes to reach its intrathoracic extensions was the method of choice, and even to-day I am not convinced that this conclusion is erroneous.

Since 1920 I have made a routine of this policy, and I believe that I can claim to have rationalized and standardized the use of radium as an indispensable adjuvant to operation for breast cancer

At the time of the operation, before the wound is closed, a twelve-milligram tube of radium element, screened by 1 mm of platinum, is introduced from the axilla and is pushed up internal to the vein above the first rib, so that it comes to he just over the lowest of the supraclavicular glands. This gland, situated in the lower and inner angle of the posterior triangle just over the subclavian artery, is the first of the glands above the clavicle to be invaded by breast cancer

455

Similar tubes are then pushed into the intercostal muscles at the inner end of the first, second and third intercostal spaces. The ends of these tubes are lodged just beneath the edge of the sternum. The tubes are withdrawn in twenty-four hours by threads of fishing gut attached to them, left protruding at a convenient point, through the sutured incision. An anæsthetic is rarely necessary for the purpose of removing the tubes

Since adopting this method I have very rarely seen recurrence at the inner end of the upper intercostal spaces or in the supraclavicular region—the sites of election for recurrence, according to my previous experience. Broadly speaking, and with very rare exceptions, the sites of implantation of the radium tubes are rendered immune to recurrence. But of late years I have on various occasions seen recurrence along the edge of the lower part of the sternum, and to avoid this in future tubes should be used in the fourth and fifth as well as in the first three spaces.

Only a moderate improvement in final results can be expected from the use of radium tubes along the parasternal chain of lymphatic glands. If the disease has already at the time of operation spread to other glands within the thorax, such as the aortic glands or those at the root of the lung, the fatal issue is already decided when operation is performed, although there may be no clinical indication of the fact

In 1928, 56 of my private cases who were treated by operation with prophylactic radium had passed the three-year limit, and 46 of these cases could be followed up. Twenty-six of the cases traced remained free from recurrence three years after operation—a percentage of 565. The corresponding figure for an earlier series of private cases treated by operation alone was 47 per cent. These figures give a measure of the improvement due to the use of radium, but only a partial measure. It is reasonable to hope that the surviving radium cases

will be found as the years go on to contain a greater proportion of actual cures than the earlier series dealt with by operation alone

The routine use of radium to deal with the intrathoracic extensions of breast cancer—extensions which are frequent, clinically inappreciable, and found mainly along the parasternal chain of lymphatics—thus rests upon an unassailable basis of evidence Recently my colleague, Mr W. Turner Warwick, has advocated the still more extensive application of radium tubes to the operation field after removal of the breast. Since the disease may penetrate through the pectorals into the intercostals, and may then run along the intercostal lymphatics, this method seems to be advisable, at any rate in late cases, if sufficient radium is available, though it involves some risk of injury to the thin operation flaps

At the present time the tendency in radium therapy is to follow the example of Régaud and to use weak tubes of radium for a long period, instead of strong tubes for a short period. A comparatively small amount of radium can thus be spread over a large area of tissue, and Mr. Warwick's technique takes advantage of this fact to irradiate after operative removal of the breast not only the whole length of the parasternal lymphatic chain, the epigastric and supraclavicular regions, but also to insert other radium tubes along the line of the intercostal lymphatics in the upper five spaces as far back as the point of emergence of the lateral cutaneous nerves. The tubes, numbering about thirty, and containing in aggregate nearly 100 mg of element, are left in position for a week.

Mr Warwick says —

"The results obtained by Sampson Handley in his recent cases show an improvement on those of his previous series, which he suggests may be due to the addition to his technique of inserting radium

in the supraclavicular fossa and in the anterior extremity of the intercostal spaces

"The possible limits of the application of radium to the lymphatic spread have not yet been explored. Observations in the post-mortem room of advanced cases of cancer of the breast show that, where lymphatic spread has been slowly progressive, the upper intercostal spaces of the affected side, looked at from the pleural aspect, are frequently outlined by growth throughout their whole extent, and the supraclavicular region is infiltrated by it."

Mr Warwick contends, and I think rightly, that only after a radical breast operation has been performed can radium be placed accurately between the intercostal muscles and in the desired situation in the axillary and supraclavicular spaces

Within recent years Mr Geoffrey Keynes, in Professor Gask's clinic at St Bartholomew's Hospital, has made a notable attempt to displace operation altogether in the treatment of breast cancer, and to substitute for it an extensive and prolonged irradiation by buried radium tubes. The logic of the attempt cannot be denied. If radium can deal with the intrathoracic extensions of the disease, a conclusion for which I have produced definite evidence, the same agent should be equally able to destroy the primary growth and its extensions in the body-wall

Logic, however, is a dangerous if fascinating weapon, and its temptation is to produce a clear-cut inference by ignoring essential factors in the problem under consideration. For this reason alone, apart from the difficulty of inadequate radium supplies, it will be necessary to wait the slow process of time before radium can be accepted as a substitute for operation. Whereas clinically a breast cancer appears to consist of a lump in the breast, and perhaps a lump in the

axilla, the known facts about the spread of permeation show that the tumour is essentially a delicate and widespread reticulum of microscopically permeated lymphatics, the limit of which cannot be determined by any clinical methods of observation. The infected circle of deep fascia behind the breast may easily reach a diameter of six or eight inches in cases which by ordinary clinical standards are still operable. It may be inferred that a circle eight inches in diameter, 48 square inches in area, requires to be radiated. To this circle must be added the area of the axilla, say, nine square inches, making 57 square inches in all

Over this large area a lethal dose of radiation must be carried down at least as far as the plane of the deep fascia, which, in an adipose breast, may be shielded by six inches of fatty tissue A lethal dose must be carried also to the very apex of the axilla

Mr Keynes states that the tubes are so placed that "the whole of the carcinoma and a considerable area surrounding it will be evenly illuminated by the radiations" But the administration of a lethal and uniform dose of radiation over such a large area and volume of tissue is a difficult and uncertain matter, and has not the simplicity which Mr Keynes assumes The undertaking requires also a close and, if possible, a firsthand study of the process of dissemination, and I note that Mr Keynes has recently modified his technique to meet the danger of parasternal invasion of the thorax which I had pointed out I still think that he lavs too little stress upon the proper centring of the radiated area upon the point of origin of the disease Nor does he, in my opinion, as judged by his published skiagrams, practise the radiation of a sufficiently large circle to ensure the destruction of the microscopic growing edge of permeated lymphatics upon the deep fascia It must be remembered that an inadequate dose of radiation may actually stimulate a carcinoma cell

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Mr Keynes claims for his method that it seems to promise results comparable with or even better than those of operation, though, as he says, many years must elapse before a final opinion can be expressed. He claims "a good result in half the patients treated, although only 7 out of 26 could be regarded as operable." Within the next year or two a sufficient number of his cases should have reached a three-year limit to enable a prima facie conclusion to be reached.

I note that Keynes now advocates in certain cases a late operative removal of a residual tumour. If this proves to be necessary in any large proportion of cases, it seems doubtful whether the Keynes' method will replace, for cases still operable, diathermic operation for removal of the mass of the disease and for facilitating the accurate and selective radiation of the known paths of spread. Undoubtedly, for cases inoperable when first seen, the method of Keynes represents a great and beneficent advance.

For operable cases I think the method of Keynes, which has given me good early results, must be admitted to equal competition with ablational methods. When a patient asks me whether I advise operation or treatment by buried radium I usually offer her the choice, adding that if she has the investor's rather than the speculator's temperament she will choose operation combined with selective radiation. The last patient to whom I presented the choice at once replied "I have been a gambler all my life, and I choose radium"

I would not, however, give such freedom of choice to all patients Mr Keynes has said nothing about the deleterious action of a massive dose of radium upon the heart. In patients advanced in years, and with myocardial degeneration or organic disease of the heart, a heavy dose of radium may cause irregular and rapid cardiac action, or pericarditis. A left-sided carcinoma in such a patient can be more safely treated by

operation than by radium

Diathermy in breast cancer -It is perhaps not yet generally realized how great are the advantages which the diathermic needle presents over the scalpel in the removal of breast cancer, as indeed in many other fields of surgery The method represents not a mere optional variation in technique, but a striking improvement Its advantages depend mainly upon three peculiarities of diathermic cutting (a) That it seals most of the small vessels as it cuts them and so minimizes loss of blood, (b) that it divides nerves almost without stimulating them and leaves their exposed ends insensitive, (c) that during the operation it supplies heat to the body generally and especially to those parts which are exposed for the purposes of the operation The three principal causes of operative shock, namely, violent nerve impressions, loss of blood and loss of heat are thus minimized

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The Treatment of Primary Carcinoma of the Breast with Radium.

By GEOFFREY KEYNES, M D, F R C S

Assistant Surgeon, St Bartholomew's Hospital, Surgeon, Mount
Vernon Hospital and Radium Institute

THE relatively good results obtained in treating carcinoma of the breast in an early stage by operation have depended upon the accessibility of both the primary growth and of the axillary lymphatic glands, which receive the greater part of the lymphatic drainage of the breast The aim of operation has been to extirpate the mammary gland with its immediate surroundings, both over it and under it, together with all the lymph glands that are within the reach of surgical technique This has necessitated a wide removal of skin, an extensive denudation of the chest wall, and stripping of the axillary lymph channels, which has often resulted in serious interference with lymph drainage from the arm Although the operation is severe, the results have fully justified its performance, and no surgeon will lightly abandon it in favour of any alternative procedure

It was clear, however, that the patients, at any rate, would welcome the introduction of another treatment not involving mutilation of the body, provided that reasonable assurance of its efficacy could be given. With this object in view, a method of treating carcinoma of the breast with radium has been elaborated, and after eight years' experience of its use at St. Bartholomew's Hospital and elsewhere, I feel able to state that the results to be expected are, at any rate, as good as those obtained by operation, and perhaps somewhat better, without the disadvantages attendant upon an extensive

operation In many instances, indeed, the breast has been restored to a condition so nearly normal that it has been difficult to believe that a carcinoma previously existed. The final pronouncement upon the permanence of the results can only be made when a sufficiently large number of patients have passed the five-year period after treatment. That patients may remain without signs of disease after radium treatment for more than five years has already been demonstrated.

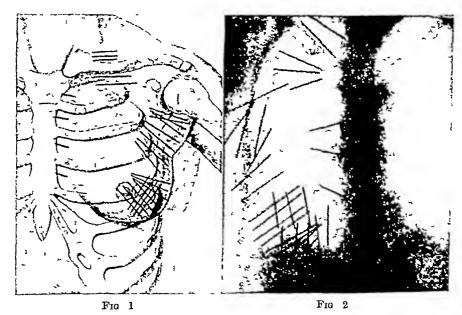
Further than this, radium treatment offers a hopeful alternative in many cases in which operation could not be successfully performed for a variety of reasons Among patients in this category, results have been obtained which would previously have been regarded as impossible

Radium treatment, naturally, has its limitations, and no miracles can be performed. If a patient already has metastatic growths in other parts of the body, it cannot be expected that these will be in any way affected by the treatment, and many disappointments will be experienced on this account. The limitations are, in fact, those of accessibility, though, as will be seen, they are not quite as rigid as those which determine the extent of operation.

The technique which has hitherto been chiefly adopted is that known as "interstitial irradiation". A large number of needles, each containing a relatively small amount of radium (never more than 3 mgr.), are placed in the tissues, and are allowed to remain in position for a relatively long time, seven days being the standard period of irradiation. The needles are inserted through small punctures in the skin, and strands of salmon gut, threaded through the eyes of the needles are left projecting on the surface. This operation can be performed in about twenty minutes under gas-and-oxygen anæsthesia, and usually causes the patient little or no disturbance. The needles are not touched during

the period of irradiation, and at the end of seven days they are pulled out, often again under gas-and-oxygen anæsthesia—sometimes no anæsthetic is required, or only a small amount of local anæsthetic. The patient is usually able to get up two days later, and in the most straightforward cases no further treatment is required

The success of the treatment depends largely upon the proper distribution of radium, and the accompanying diagram (Fig. 1) will help appreciation of the principles involved. The X-ray photograph (Fig. 2) shows needles in position in a typical case



The method resolves itself into two main problems (1) the treatment of the growth itself and the surrounding mammary gland, (2) the treatment of the different areas of lymphatic drainage

(1) The treatment of the primary growth is achieved by placing needles about 15 cm apart in the cellular tissue underneath the breast, so as to irradiate the whole of the growth and a large area around it The whole of the mammary gland should be irradiated where

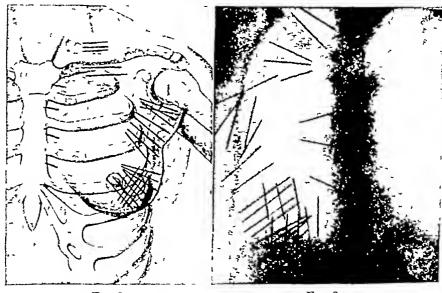
circumstances permit If the breast or the growth be very massive, it may also be necessary to introduce needles at another level nearer the surface, but it is well to avoid pushing needles into the growth itself whenever possible. The amount of radium required for this purpose is very variable according to the size of the breast and of the growth. As much as 75 mgr may be required.

(2) The treatment of the lymphatic areas consists in placing needles in a series of groups (a) under the pectoralis major muscle, (b) in the axilla, (c) below the clavicle, (d) above the clavicle, (e) in the upper three or four intercostal spaces. The two latter groups (d) and (e) are, as will be evident, an extension beyond what is possible by operative treatment. The needles in group (e) extend, indeed, a short way into the anterior mediastinum, though it is not claimed that their effect reaches further than the parasternal gland in each intercostal space. At the Westminster Clinic, interstitial irradiation has been followed in most cases by superficial treatment, but I have seldom done this myself and am not clear that it is necessary as a routine.

It will be seen, therefore, that accepted surgical principles are carried out in this method of radium treatment, the primary growth and all accessible lymphatic areas are treated in continuity, and in a successful case all malignant cells are extirpated as completely as with the scalpel, with the advantages added that there is relatively little disturbance of the tissues and there is no danger of disseminating the growth by cutting through infiltrated tissues. The outstanding fact in all radium treatment is the selective action of the gamma rays, which are chiefly utilized. If the dosage and filtration are correct, the cancer cells will disappear, and the normal tissue will be left almost unaltered, so that a virtual restoration of the organ to normal is not impossible, provided that too much of it has not already

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been destroyed by the disease The illustrations (Figs 3 and 4) show a patient before and after treatment with radium. She had a large growth fungating on the surface and adherent to the chest. She has now remained without signs of disease for two years and eight months.

After the radium treatment has been given, the patient must always be carefully watched, as further treatment may in certain circumstances be required Usually the tumour is obviously somewhat smaller within a fortnight of the treatment. The shrinkage goes on steadily, but not for three months or more is the full effect obtained. If at the end of five months the tumour has not completely disappeared, further treatment may have to be considered, either a second dose of irradiation or local excision of the residual tumour

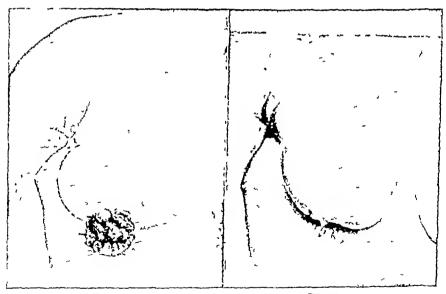


Fig. 3 Before treatment.

Fig 4 After treatment

A watch must also be kept for possible recurrences of the growth in other positions

In treating a small and early growth, anything

beyond a single radium treatment has hardly ever been The best results have, in fact, as with operation, been obtained in the most favourable cases So good, indeed, have the results been that the earlier the growth the more confidence I feel in recommending the treatment, and I should strongly deprecate the reservation of radium for the advanced or hopeless categories of patients The treatment should not, however, be withheld from any category unless the growth is clearly too large for radium, or unless it is obvious that metastasis has already taken place, so that no treatment is likely to prolong the patient's life astonishing degree of success can often be obtained even in patients in whom the disease appears to be advanced or inoperable, and many patients who were apparently "hopeless" have lived in comfort for several years after treatment, and have finally died without any local recrudescence of the growth

In using radium treatment in other parts of the body, sometimes it has been found that the primary growth is sensitive to radium, but that the secondary growths in glands are relatively insensitive. This does not appear to be the case, however, in carcinoma of the breast Enlarged glands in the axilla usually respond extremely well to irradiation, so that their presence is no contraindication to the use of radium. The treatment given to the lymphatic areas described above is used as a routine, whether glands can be detected or not, for the fact that no glands can be felt is no proof that none are infected. The occurrence of secondary glands has seldom been noted after routine prophylactic treatment, so that the procedure seems to have been fully justified.

Radium treatment compared with operation may appear to be a trivial affair, and it is fortunate that for the patients it usually proves to be so—It can, however, prove a dangerous tool if applied with insufficient care,

knowledge, or judgment The worst discomfort that the patient may normally be called upon to endure is a superficial skin burn over a small area, and this it is sometimes impossible to avoid if she is thin, so that the needles cannot be placed more than a short distance from the surface The discomfort is, however, temporary, and no scarring results

The day has now passed when all radiological treatment was kept strictly within the province of the radio-Interstitial radium treatment as described above is a surgical procedure, though it requires knowledge of the properties and dangers of radium for its Further than this, it often needs to successful use be combined with purely surgical treatment, and, although it is more than five years since I have performed the major operation for carcinoma of the breast, I am far from making the claim that radium has superseded surgery I believe, however, that radium is the treatment of choice as a first stage in the majority of patients For those with "inoperable" tumours, it is the only possible treatment. For those with the earliest growths, it is the preferable treatment, because the patient is restored to normal For those with advanced, but still operable tumours, no known form of treatment can be relied upon to save the patient's life, because in most cases the disease has already passed beyond the local—that is, the curable—stage, I believe that on the whole there is less suffering for the patient with primary radium treatment than with operation, but this may be a matter of opinion

The foregoing remarks and opinions are based upon the careful study of 130 patients with primary carcinoma of the breast treated with radium

Radium Treatment of Cancer of the Breast.

By STANFORD CADE, FRCS

Assistant Surgeon to the Westminster Hospital Surgeon, Mount Vernon Hospital and Radium Institute

THE possibilities of radium treatment in malignant disease of the breast have been amply demonstrated in the last few years. Although radium treatment in other anatomical situations was originated in Swedish, French and Belgian centres, it can be justly claimed that for the breast the pioneer work has been done in England. As a palliative measure for recurrences or inoperable cases, radium has long been in use. Geoffrey Keynes, however, was the first to treat operable and early cases by radium as the alternative to radical amputation.

At Westminster Hospital during the past five years the treatment by radium of cancer of the breast has passed through various stages. At first, surface application alone was used, then needling, and finally with increased experience the two-stage method of irradiation was adopted. From the observation of 90 personal cases of cancer of the breast treated by radium has gradually crystallized the conviction that a combination of the two-stage treatment, followed or proceeded, if necessary, in selected cases, by some form of surgery, gives the patient a better chance of recovery than excisional surgery alone. The time has not yet come to postulate a method of treatment applicable to all cases, differences of methods are dictated by numerous factors. These will be considered later.

THE TWO-STAGE RADIUM TREATMENT

The two-stage treatment consists in interstitial 469 HH

irradiation of the breast and lymphatic territory, followed after an interval by surface application by means of a plaque. The interval between the two has been reduced to one week, although in the earlier stages as long as four to six weeks were allowed between the two stages The time occupied by the treatment is about four to five weeks, followed by a period of convalescence and healing of the skin the economic standpoint, needling as the sole method of treatment presents great advantages it requires less radium, the treatment lasts a shorter time, hospitalization of the patient is reduced to a minimum, and the period of convalescence is brief, but in the treatment of malignant disease, the economical factor is of the least importance, and, if considered at all, should be done so last of all The evidence that a two-stage treatment produces more lasting results and in a larger number of cases is sufficient to make the economic factor of no importance

First Stage Interstitual Irradiation — The needles employed vary in size and, therefore, in radium content, but the linear intensity should be the same in all needles The total quantity of radium necessary to irradiate a breast varies primarily with the size of the breast, secondly with the size of the tumour Forty mgs of radium may be enough for a small breast, for a large pendulous breast as much as 100 mgs may be required The object in view is to surround the neoplasm with radium, to treat the whole breast and to treat the lymphatic area more extensively than any modernized Halsted's operation could do-and to do this in as homogeneous a way as possible, with an intensity of irradiation evenly distributed over the whole area treated In order to achieve this it is necessary to have at the disposal of the surgeon needles of various lengths, long needles (60 mm and 40 mm) are useful, but cannot give a uniform irradiation in all situations, the

very length, which is claimed as a great advantage, is a handicap in some situations. The needles must vary in size from 20 to 60 cm over all length if the flexibility necessary to provide accurate irradiation of uniform intensity is to be obtained. The needles used must have trocar points and eyelets, the screenage employed is of a minimum of 06 mm of platinum, although 065 and 07 mm are an advantage, both to strengthen the needle, preventing its being bent or broken or otherwise damaged, but chiefly from the fact that pure gamma irradiation is desired. In the vicinity of the intercostal cartilages it is customary to employ needles of 1 mg of radium, 24 mm over all length, screened by 08 mm of platinum, so obviating all risk of chondronecrosis.

The needles contain radium salt, the use of emanation is a definite disadvantage as it requires the treatment to a much shorter period of time (half life period of 48 days), and during that time there is a constant fall of intensity As carcinoma of the breast belongs to the group of glandular carcinomata, which are as a rule much more radioresistant than the squamouscelled variety, the time factor is of very great importance, it is impossible to hope for retrogression of the growth or for more than temporary inhibition if the active period of treatment is shortened to about five days Prolonged irradiation is essential in this situation, hence the futility of attempting to do so with emanation when the interstitial method is used, radon seeds present a further disadvantage, namely, their size, to attempt a uniform distribution of seeds into a mobile organ like the breast presents great difficulties, and a skiagram of the result obtained is sufficient evidence of the great difficulty of implanting the seeds equidistantly throughout the whole breast. The necessity of treating the whole breast and glandular area is paramount Sir Lenthal Cheatle has shown that no part

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of the breast is free from possible disease, although the tumour itself may be localized on clinical examination

Dosage —It is customary to calculate the dosage in milligram-hours This expression of dosage has been criticized severely by many workers, both clinicians and physicists The criticism is valid from a scientific point of view, but as the critics have failed to provide an alternative, this method still remains the best available, providing the following specifications are given number of needles, quantity of radium per needle, total quantity of radium, screenage, time and method of irradiation For example, a total of 50 needles containing 75 mgs of radium left in position for seven days equals 12,600 milligram-hours The specification of the needles must also be given and their distribution noted in a diagram The expression milligram-hours provides thus a certain measure of comparison, and with experience it acquires a significance which conveys definite information of practical importance

Time —The minimum time for interstitial irradiation is seven days, in some cases as long as ten days is required, in a few cases fourteen days is deemed necessary, in such cases the needles are removed at the end of the first week and redistributed again (immediate reneedling) in different portions of the breast

Technique —The preparation of the patient is similar to that for any surgical procedure—the skin is prepared with spirit and the axilla is shaved, strict aseptic precautions are essential—Gas and oxygen anæsthesia is employed, local or regional anæsthesia may be employed in patients temperamentally suitable for it—The needles are selected with care, the configuration of the area to be treated, the size of the tumour and of the breast, the presence or absence of axillary glands being deciding factors

All needles are threaded with carbolized silk or linen

thread, a knot is tied about 3 or 4 mm from the eye of the needle, this knot acts as a stop and prevents the needle from penetrating into the tissues further than is desired. The threaded needles are then boiled for five minutes.

The tumour is first irradiated, long needles are placed deep to it in the substance of the breast or the pectoral muscles as occasion demands, and form a deep barrage, a second layer of needles is placed superficially to the tumour, if the primary growth is large, needles are introduced into the tumour itself The breast is then irradiated, the glandular and fatty tissue is needled, the needles being placed in parallel rows in couples tied to each other, or in a circle, radiating from the tumour as a centre The threads are collected and tied in a bunch This guards against the accidental loss of a needle in the dressing, should it become displaced lymphatic area is next needled, (a) the supraclavicular fossa needles being placed above the clavicle and parallel to it, also along the lower half of the sternomastoid muscle, (b) the costo-coracoid area, needles being inserted along the lower border of the clavicle, either parallel with it if long needles are available, or vertically if shorter needles are used, the needles must be placed accurately, deep to the pectoralis major muscle, (c) the anterior parts of the intercostal space are next needled, the second, third, fourth and fifth spaces are identified and a needle, containing 1 mg of radium screened by 08 cm of platinum, is placed in each space The upper end of the rectus sheath is also needled

The axilla requires special attention. Needles are placed deep to the pectoral muscle from its external margin inwards along the anterior axillary wall, the same is done along the posterior wall on the subscapularis muscle, the apex of the axilla is reached through the pectoral muscle, and a few needles are

placed along the brachial and axillary vessels The midaxillary line is needled from the apex of the axilla to



Fig. 1—Skingram showing radium needles in Fosition above the clavicle, near costo-coracoid membrane, in the intercostal spaces, in the breast and in

the lower border of the costal margin When this is completed, it is seen that a very large area of the chest wall is surrounded by radium needles, and the space so delimited contains the breast and the lymphatics, which are also irradiated The skin punctures are sealed with mastisol or collodion, and the whole area covered with a thin layer of gauze, sealed to the skin at the edges, the

outer dressings are then applied

After-treatment -The needles are left in position for seven days During that time the dressings are disturbed once, on the third day, the outer dressings are removed, but the gauze keeping the threads in position and covering the punctures is not disturbed needles are removed without an anæsthetic Except in very rare cases, all needle punctures are inflamed when the needles are removed, some debris and pus can be squeezed out from each puncture hole This is done, and hot fomentations applied during the first day, the area is then kept dry with talc powder In a certain proportion of cases the tumour at the end of the treatment shows definite changes in consistency and size, it is smaller, softer and less defined, it merges imperceptibly into the surrounding breast tissue, which is somewhat ædematous An immediate response is of good prognosis, and it is found that those cases in which there is no delay in obtaining a reaction respond well to treatment The skin around the needle puncture is red, but there is only rarely a generalized erythema The patients tolerate the treatment well, some discomfort is experienced when the needles are in position, but pain is absent Needling a breast is a minor surgical procedure, and there is no comparison with the severity of a radical amputation The mortality of needling Accidents are reported from time to should be nil time, such as perforation of the pleura or pericardium, puncture of an intercostal or internal mammary vessel and consequent hæmorrhage, or loss of a needle These accidents are avoidable, and with experience and care should occur so rarely as to be negligible

Second Stage Surface Irradiation—The second stage consists in the application of radium at a short distance from the skin. It is spoken of as surface irradiation to distinguish it from distance application, where radium is applied at five or more centimetres.

from the skin by means of a "bomb" or a "pack" In surface therapy the skin-to-radium distance varies in different clinics, at Westminster Hospital the distance employed in the majority of cases is fifteen millimetres. The quantities of radium employed, the time of irradiation and other details set out here apply to this distance (15 mm), and would naturally vary if this distance be altered

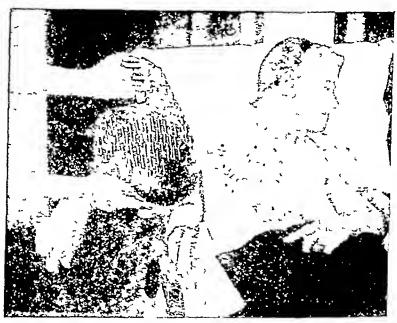


Fig 2—Second stage of irradiation Columbia paste jacket showing needles in position The first stage is indicated by spots showing where the needles had been. The large shadow is the position of the tumour

The object of the plaque is to provide a uniform irradiation of low intensity over a prolonged period of time. It gives the patient a second chance of inhibiting the growth, and ensures adequate treatment of the skin and subcutaneous tissues up to a depth of 2 or 3 centimetres. The irradiation is much more uniform than that obtained by the interstitial method, and the time factor can be increased up to three weeks. It provides the possibility of fractioning the time of irradiation, so as to allow periods of rest, alternating with periods

of treatment As glandular tissues vary in their response to irradiation with the stage of cell division and cell activity, fractional treatment is more likely to ensure sterility of neoplastic cells

The distance between skin and radium is obtained by means of plaques of requisite thickness Radium is placed on the outside of the plaque Various substances may be employed to make the plaques, such as felt, spongy rubber, wood and plaster The most convenient and most efficient medium is a mixture of paraffin, bees' wax and sawdust, known as columbia paste This can be prepared in any hospital dispensary or bought readymade in sheets of various sizes The sheets are of uniform thickness, one side is pale (bees' wax), the other dark (sawdust) Plaques of convenient size and shape are prepared for each individual case The columbia paste-sheet is placed in hot water and allowed to soften, the sheet is then malleable and is moulded on the chest accurately, the darker side to the skin, fitting the lower part of the neck, the breast, the lateral aspect of the thorax and the axilla When hardened by cooling it retains its shape

The needles are distributed equidistantly on the outer surface of the plaque in parallel rows, the distance between two adjacent needles and two adjacent rows is such as to provide uniform distribution at a depth of 15 mm and more. The quantity of radium required varies with the size of the plaque from 65 mg to 100 mg of radium. The radium needles are covered with adhesive plaster, so that the plaque and radium constitute a complete apparatus and loss of needles is guarded against.

The plaque is applied daily for a number of hours, varying from twelve to sixteen, according to the tolerance of the patient and the effect desired. The treatment is continued for two or three weeks. At the end of the second week there is generalized erythema.

over the area covered by the plaque, the depth of the erythema increases rapidly after that time, blisters appear and the skin begins to peel The beginning of desquamation indicates that a maximum dose has been Regaud calls this reaction "selective administered radiodermatitis ", it is the desired response and is not a radium burn, it heals within four to six weeks and is painless, or nearly so The necessity of continuing the treatment until desquamation starts is dictated by the experience that in radium therapy to-day the maximum dose compatible with safety is the optimum dose, it is likely that with further knowledge and better equipment it may be possible to avoid peeling in future The appearance of erythema and peeling depend upon the quantity of radium employed, the time of daily exposure and the duration of the treatment, but besides these factors there is an individual variation from patient to patient, so that of two similar patients receiving identical treatment, one may reach the stage of erythema in five days and the other in sixteen days, this individual variation depends, amongst other things, upon the structure of the skin and cannot be assured beforehand at present, although research in this matter is being carried out. It is preferable to prolong the treatment over two weeks as a minimum, and the details of the treatment, such as quantity of radium, screenage and period of daily exposure must be arranged accordingly With experience, it is possible to achieve the maximum of effect with the minimum of peeling

After-treatment—The after-care of the patient is important. During the treatment by means of plaques of extensive size there is a marked and progressive diminution in the number of white corpuscles in the blood. Periodical blood-counts show that the number of leucocytes may fall to 1,000 or less, and the number of lymphocytes has been reduced to 10 or so in several

cases On cessation of treatment, the condition rapidly returns to normal It is at times advisable to interrupt the treatment for two or three days at the end of the first and second week to allow the blood to recover During the treatment the patient must be encouraged to get up daily and go out for walks Fresh air and sunshine are important Nausea is frequent, loss of appetite and general depression usual, and, as a rule, loss of weight The patient has to be encouraged to continue the treatment

When erythema has developed, the skin is kept diy with a non-metallic powder. When peeling occurs, healing should be encouraged and the dressings applied so as to protect the law surface. Leno bandages soaked in liquid paraffin mixed with radiostol is a good dressing. Healing takes place from the periphery, and is lapid if the desquamation has not been allowed to destroy the deeper layers of the skin.

INDICATIONS FOR SURGERY

The disappearance of a small tumour is of nearly universal occurrence Large tumours take several months to disappear, and in a number of cases a residual mass is left. Many breasts previously irradiated have been subsequently amputated, and histological evidence of the results of irradiation is now forthcoming some cases careful examination under the microscope reveals no malignant cells, only fibrous tissue, in other cases degenerated cells are found, in some, active malignant cells are present A patient with carcinoma of the breast treated by radium must be kept under observation and examined periodically, as long as the tumour is diminishing in size, no active treatment is indicated. if at the end of six months there is a residual mass in the breast, this should be excised The excision is done with the diathermy needle and the wound completely closed The time of excision and the amount of

tissue to be removed requires great judgment and experience A second radium treatment is not advisable

Biopsy—From the patient's point of view a biopsy is not necessary if the clinical evidence satisfies the surgeon that the condition is malignant. Should a doubt exist, cutting into the tumour is not advisable. The whole tumour, with surrounding tissue, must be excised by diathermy and immediately examined. Frozen sections prepared by an expert are reliable evidence. The wound must be closed, and a radical needling proceeded with

Radical amputation in combination with radium—
If a radical amputation is decided upon, it is not advisable to combine this with interstitial needling. A radical amputation is indicated in operable cases when the breast is very large and pendulous and the tumour

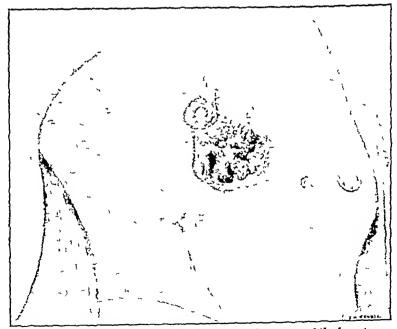


Fig. 3, a—Recurrence after radical operation for cancer of the breast. a small scirrhus, in such cases, interstitial irradiation cannot be carried out satisfactorily, and the distribu-

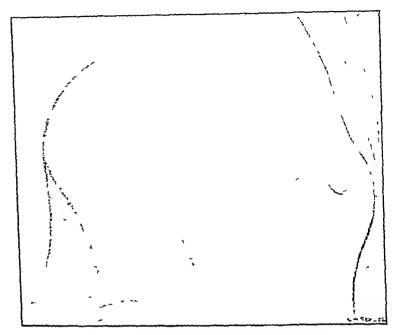


Fig. 3, b -The same patient after radium treatment

tion of the needles is difficult. When the wound is entirely healed, surface irradiation is given. To leave the needles in position after a radical operation provides no advantage, interferes with healing, encourages sepsis and is theoretically unsound, as, if radiation is to be successful, the less the interference with the lymphatic and blood supply the better, and if a radical amputation is done, the condition at the end of the operation is the worst possible for successful irradiation.

Local amputation prior to irradiation—This is indicated in the presence of a large fungating growth. It aims at the removal of some of the malignant mass and at diminution of sepsis—It should always be done by diathermy—removal with the scalpel is never justifiable—and the sloughs allowed to separate before needling is proceeded with

The treatment of post-operative recurrences is essentially radiological Radium has given very good

primary results Large fungating masses, axillary glands and skin nodules have been made to disappear in nearly all cases treated The benefit is purely local, as the development of visceral metastases is in no way obviated or delayed The treatment of recurrences should, if and when possible, consist of two stages similar to that described for the primary lesion

CONCLUSIONS

The position of radium therapy in the treatment of cancer of the breast cannot be definitely assessed till five-year periods are available for operable cases That radium can provide complete retrogression of the disease has been proved in numerous cases manency of results is greatly enhanced by the two-stage treatment Radium therapy as the first measure in the treatment of an operable case is entirely justifiable, and the earlier the case the better is the result For inoperable cases and for recurrences, radium offers a great deal of palliation and cannot be equalled by any other method of treatment

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The Modern Treatment of Carcinoma of the Breast.

By DUNCAN C L FITZWILLIAMS, C M G, M D, Ch M, F R C S

Surgeon, St Mary's Hospital, and to Mount Vernon Hospital and Radium Institute

HE introduction of a new method of treating cancer is hardly likely to achieve ready acceptance by medical men who have been brought up to think, and think rightly, that the knife is the only method, unless strong proofs of its effectiveness can be produced For this reason the radium treatment of malignant disease has been slow in gaining ground It was only after the International Congress on Cancer, held in London in 1928, that the medical profession in this country woke up to the fact that the leaders of this branch of surgery had accepted radium as a respectable addition to the surgeon's armamen-After that, education advanced rapidly though there are many still who are ignorant of the possibilities which can now be confidently held out to sufferers from cancer

The history of the treatment of cancer of the breast is typical of what we should expect in a conservative profession such as ours. The tongue was one of the first organs in which it was used, as the results of surgery were so bad in those cases, then the uterus was tried, then the rectum, but the breast was considered the one place where surgery was pre-eminently successful, and for long, radium was not considered My male wards at St. Mary's Hospital are full of tongue cases being treated by radium—probably because of a book I once wrote upon the subject, which,

on account of radium, was out of date when printed, and since its issue, nearly five years ago, I have not put a knife to a tongue Probably more than half the carcinomata of the uterus are treated with radium where radium is available. With the rectum we have not been so successful, while with the breast, beginning with quite inoperable cases some five to six years ago, and watching the effect carefully. I have come, to-day, to the position where breast cases are treated by radium in preference to the knife position, however, it is only fair to state, is not yet adopted, I believe, by any other surgeon except, perhaps, by Mr Geoffrey Keynes, who has done such excellent work at St Bartholomew's Hospital I am, therefore, going to give my own ideas upon the subject, however egotistical it may sound At first only inoperable cases were treated, later, as one watched the effect of radium, more favourable and earlier cases were tried, until, to-day, about 75 per cent of cases are treated with radium as a matter of course, with the knowledge that radium can produce every bit as good a result as the knife, without the mutilation future for radium is highly favourable, but I refrain from expressing my hopes upon the subject and will merely confine myself to facts In all I have treated more than 250 cases, of which some 89 have been pri-It was with the utmost difficulty that one vate cases brought oneself to leave the knife and adopt an untried method, and it was done with a feeling of great Similar timidity is shown in responsibility writings of others who are just beginning to use radium

Breast cases can be divided into two classes -

(1) Those where the disease is in the breast and glands and altogether outside the thoracic and abdominal cavities

(2) Those in which it has already gained the in-

ternal organs

The second class are doomed, whatever method of treatment is adopted, the internal metastases will kill them, and the removal of the external disease will only have the temporary effect of making the patient believe she is cured. Unfortunately, we can never tell the two classes apart—only in the very early cases before malignant signs have established themselves can we really hope that patients are still in class one

In dealing with the primary growth where the glands are not or only slightly infected, the same technique has been followed by all who have worked upon this subject. We may have given ideas to each other, but we have all come to the same conclusions, and the techniques of Mr Geoffrey Keynes, Mr Stanford Cade and myself are all very similar. It aims at destroying the primary growth completely and also destroying any cells which may possibly have been carried to the glands by embolism along the lymphatics either to the axilla or to the chest and abdomen

How can this best be done? The consensus of opinion at the moment is that it is preferable to attack the growth from its deep surface, as a larger dose can be given without affecting the skin. Moderate areas of radium necrosis, if they do not affect the skin and cause ulceration, do not seem to matter. Needles are, therefore, inserted behind the growth. In a large breast, the needles enter the breast substance, in a small breast they pass between the gland and the pectoralis major.

Speaking generally, needles will destroy all cancer certainly for an area of 1 centimetre round them and possibly for an area of 3 centimetres. The needles should be placed parallel to each other. Two layers of needles are used at right angles to each other so as to form a gridiron behind the tumour.

To insert the needles parallel is not easy, some 485

simply lift up the breast and thrust them in, some use a canula, but, after much experiment. I find the best method is to use very long needles-skewers, I call them-6 to 8 inches long My radium needles are always threaded with copper wire (gauge 22 to 25) the

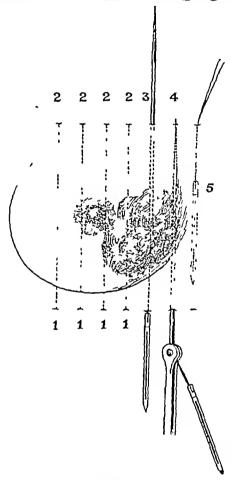


FIGURE 1

Points where skewer is to be inserted.

(2) Points where skewer is to emerge

(3) Skewer emerging drawing needle under tumour (4) Skewer being inserted (5) Needle drawn in place Wire in each case Wire in each case has been shown much shorter than in reality

ends of the wire are threaded through the skewers (brass, iron or silver wire may be used, but none are as

good as copper) Marks are made upon the skin on one side of the breast 1 to 21 centimetres apart, and the same is done on the other side. The skewer is thrust in at one mark and emerges at the other, the skewer is then removed from the wire and another inserted at the next mark till all are in place. Then by pulling on the wires the radium needles can be placed accurately beneath the tumour In large tumours marks at one inch distance are made upon the wires, and at the end of three days the radium needles can be drawn further along so that the whole area is radiated remaining portion of the breast round is punctured by needles arranged in a circular manner, their points converging on the growth so as to ensure the whole breast being radiated I find it is convenient to have these latter needles mounted in tiara fashion, five on each wire, this lessens the number of wire ends to be

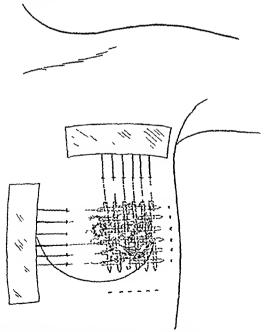


Figure 2 —Gridiron in position. Other needles surrounding tumour and lying along lymphatics are not shown.

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secured by plaster

Lastly, in large tumours a tube of 25 milligrammes of radium is fitted into a silver trocar pointed con-

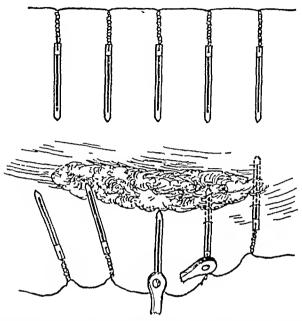


FIGURE 3—Needles arranged in a tiara of five on wire, which is an oxceedingly handy way of using them and makes it easy to remember the numbers and sizes of the needles used. If wire is used the number of sharp ends of wire is minimised. (From "Radium and Cancer" London H K Lewis & Co., Ltd.)

tainer, which easily penetrates the tissues, it is mounted on wire with markings at intervals. This is thrust into the tumour so as to be near its opposite side, the container is pulled out one inch daily till near the surface, when it is removed. My needles for the breast are 65 and 44 millimetres long. They are made with a long silent area near the eye. In this way I do not get the small area of skin necrosis usually met with as the result of the β rays, the radium being situated too deeply to affect the skin, though it is not necessary to bury the eye of the needle except in the case of those underrunning the breast

No anæsthetic is ever needed to remove the needles because if the eye catches in fibrous tissue, as fie-

quently happens, it can be readily freed by simply bending the wire like a well handle and twisting it round, this frees the needle at once Long needles are inserted along the lymphatics going to the axilla Long needles are inserted into the axilla reaching right up to the first rib, and along the subscapular lymphatics

In early cases this is all that is necessary to forty needles are needed, containing 60 to 90 milligrammes of radium, depending on the size of the

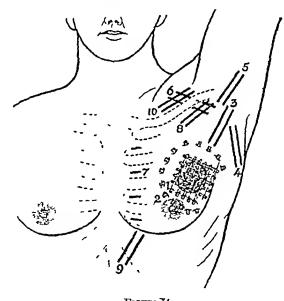


FIGURE 4 Author's method of placing needles

(1) Needles placed under the growth, sometimes one, sometimes two layers ın gridiron form.

- in griding form.

 (2) Needles placed round the growth, sometimes one, sometimes two circles (not shewn at the side)

 (3) Needles along the lymphatics at the lower margin of pectoralis minor

 (4) Along the subscapular lymphatics

 (5) Along tymphatics of axilla.

 (6) Position of needles up under clavicle if the axilla is cleared of lymphatics
 - (7) Along lymphatics accompanying the internal mammary vessels
 - (8) In position of costo-coracoid lymphatics (9) Towards the dangerous angle
 - (10) Above the clavicle
 - It is not necessary to insert all these needles every time (From "Radium and Cancer" London H. K. Lewis & Co, Ltd.).

tumour and the dimensions of the breast In voluminous breasts I have placed four layers of long needles behind the tumour, two at right angles to each other in the breast tissue, and two at right angles to each other between the breast and the pectoralis major

In one very large breast containing a very rapidly spreading medullary carcinoma, I did this and surrounded the area with two concentric rings of needles. The amount of radium to the breast alone was 208 milligrammes. The lymphatics were dealt with later as my stock of available radium was exhausted. The results were unexpectedly gratifying, and have since remained so, though ultimately internal metastases. I feel sure must show themselves

In later cases more attention must be paid to the lymphatics and shorter needles placed below the clavicle, in the intercostal spaces, in the angle between the ribs and the xyphisternum Fig 4 shows the positions where needles are needed in certain cases I understand that my colleague, Mr Keynes, treats his



FIGURE 5—Columbia paste currasse applied to chest shewing needles in position, sunk in the wax. The lead covering is thrown over the shoulder (From "Radium and Cancer" London H K Lewis & Co, Ltd.)

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cases by one insertion of needles and nothing else and gets excellent results. But for two years I have submitted my cases to surface radiation afterwards, because the main attack on the growth has been from the deep surface and I have not felt quite sure of the skin surface. They, therefore, wear a plaque of Columbia paste with radium applied to the outer side, for a time varying from two to four weeks according to the number of hours a day they wear it and their sensibility to radium, a well marked erythema with superficial desquamation being aimed at. Anything more severe than this gives pain and is as a rule bitterly resented by patients, though I must say I sometimes overstep the mark in spite of the greatest care, but at the present moment one is rather anxious to err upon the safe side.

This is the procedure I have adopted till quite lately, but when contemplating the excellent results obtained by gynæcologists by three applications of radium, I have again modified my technique to follow theirs. Instead of leaving my needles in six or seven days on a single occasion as formerly, I now leave them in for five or six days, then give the patient one or two weeks rest and reinsert them, but not in the same place. The gridiron is arranged differently this time, and the surrounding needles are placed between their former situations.

It is too soon to give any result of these different methods of treatment, but I have been greatly struck by the fact that within a week of the removal of the needles the second time the tumours have given place merely to a firm swelling which has faded off into the surrounding tissues, a much more rapid effect than any I have seen formerly Later, of course, the surface radiation is given as usual My first cases were all beyond any other form of treatment, and the early cases fall mostly into the last three years, but so far

I can say that the radical mutilating operation to which I was trained, and which I have practised so frequently, is becoming, with me, a thing of the past

All my operation cases—and I still operate upon certain ones—have a surface radiation applied to the whole side of the chest and axilla, and I think that that is an indispensable adjunct to the radical operation which it would be foolish to neglect. It is carried out as soon after sound healing has taken place as possible. In many cases, too, I do a local operation and rely upon radium to exterminate the cells round about, which I formerly hoped would be dealt with by the old radical operation. If radium is buried in the axilla at the time of operation, a method I used largely at one time, but have now abandoned, it should be removed in three days' time at the longest. The effect of radium on the cells is to prevent their movement and multiplication, hence delaying healing and increasing the risk of sepsis. I feel strongly that this method should not be used.

Metastases —Secondary masses present a different problem I divide them roughly into the solitary recurrence and the multiple or miliary recurrence. The solitary recurrence is the result of malignant embolisettling and growing in a suitable soil. The solitary recurrence may appear at any time, usually after two years, and may be much later. It need not necessarily be single, as its name implies, for two or three may develop in different parts of the body at the same time, but they have no connection with each other. These can be treated easily and certainly just as if they were primary growths. They are underrun by one layer of parallel needles of sufficient length to deal with them. The needles should be left in for four to seven days, depending on the size of the mass. The tumour, in my experience, invariably disappears. The whole area round should, however, receive careful surface radia-

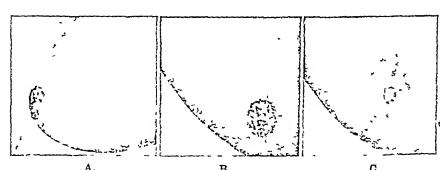
tion Each tumour is dealt with in the same way

The multiple or miliary recurrences are due to quite a different cause they are due to the knife at the operation cutting across lymphatics loaded with carcinomatous cells and liberating them on to the tissues. They grow and appear within two years, often within six months, and spread along the lymphatics, each being a focus of spread, until the side of the chest may show hundreds of small nodules varying in size from a millet seed to a bean. In these cases—and they are frequently met with—the patient would really have lived longer if she had had no operation to sow the disease broadcast.

We used to try to limit the spread of these small masses by surrounding the area with needles thrust into the tissues one behind the other, as recommended by Mr Sampson Handley, but this method has now been abandoned as useless. The nodules may be dealt with by thrusting small needles under them or between two if close together. This, however, is a slow method and does not prevent their formation at sites close by, and it should also be discarded. The best method of dealing with them is, undoubtedly, by surface radiation, which not only destroys them, but prevents their development, as cells which have not yet shown themselves are also destroyed.

In dealing with metastases it must be remembered that our fight is usually a losing one. In the solitary metastases, if embolism has lodged cells in a position where we can see them growing, it is only too probable that similar cells have become lodged elsewhere in the internal organs where we cannot detect them, and these will produce their effect later. The multiple metastases are almost sure evidence of widespread infection, and the peritoneum seems particularly liable to early infection once the avillary glands have been removed.

Paget's disease reacts remarkably well to radium I have always met it in voluminous breasts. The technique I have used has been to puncture the breast with needles of 44 or 65 millimetres long, from an inch beyond the edge of the ulcerated area. The needles converge slightly beneath the nipple. The ulceration has always cleared up so remarkably that surface radiation has never seemed to be necessary, and I find I have not used it. I believe now it would be safer to do so. The last case was sent me by my colleague, Dr. Graham Little, and the effect of radium can be seen in the illustration (Fig. 6).



A. B C FIGURE 6—A and B before treatment C during treatment

Fungating malignant ulcers are among the most distressing conditions the surgeon can be asked to It matters little whether they originate in the primary growth or in secondary masses The effect of radium on these conditions can only be described as I have always dressed the ulcer with miraculous strong antiseptic fomentations to try to get it as clean as possible before starting treatment I am not at all sure, however, that this is really necessary, as I have never seen trouble follow even in the most offensive conditions An anæsthetic is given and long needles thrust into the base of the mass from a short distance outside its edge, shorter needles are thrust into the floor of the ulcer, tubes of 25, 30 and even 45 milligrammes can be placed in pockets, if such exist I am

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writing of large necrotic areas of six to eight inches across, many such cases having been sent to me as a last resort. Gauze soaked in liquid paraffin and flavin covers the area and plaster fixes the ends of the wires, a layer of wool is placed over, and the whole fastened in place with strapping and a bandage. Frequent dressing is needed as the dressings become very foul

with discharges

During the dressings the needles are very likely to come out of the rotten tissue of the floor of the ulcer, and great care must be taken not to lose them-they can be reinserted in different places in the necrotic area as there is little or no sensation in the mass tubes should also be moved about at each dressing There is little fear of an overdose or radium necrosis following even after heroic doses are given malignant tissue dies in any case and is cast off, healthy granulations form and the ulcer rapidly contracts down, and, as a rule, heals completely The mental effect of such treatment on a patient, worn down by anxiety and constant dressing, always conscious of the foul odour of the discharge and thinking herself doomed, cannot be overstated Their whole outlook changes, they put on weight and think themselves cured

These are my present methods for carcinoma of the breast, each case is judged upon its merits and the patient is then recommended the treatment thought most appropriate. The value of radium will be put to severe tests at the new Mount Vernon Hospital, of 150 beds, under the supervision of an advisory committee and under the direction of Sir Cuthbert Wallace, and time will show its value, but, so far as we can see, the radical operation will give place to a more humane and less mutilating treatment, and if the public realize this, they will be more likely to consult their own practitioner as soon as a suspicious lump is found, and not wait until it is too late for any form of treatment yet conceived

Some Aspects of the Radium Treatment of Carcinoma.

By Sir G LENTHAL CHEATLE, KCB, CVO, FRCS Surgeon and Lecturer in Surgery, King's College Hospital

With Cytological Reports of Some Cases.

By R J LUDFORD, DSc, Ph D

Laboratories of the Imperial Cancer Research Fund

ITH the exception of rodent ulcers the treatment of my cases of malignant disease by X-rays has been, on the whole, unsuccessful Occasionally a tumour of the breast regressed, and also occasionally cutaneous deposits disappeared X-rays had not any beneficial effect on any case of squamous-celled carcmoma These failures may have due to a want of knowledge and necessary When I turned to treating malignant tumours by radium I was at first obliged to use needles that contained either too large a dose of the element My results were so unitself or radium emanation satisfactory at that time that I asked Mr Stanford Cade if he would kindly treat a male patient of mine who had an moperable extensive neoplasm in the mouth Mr Cade treated him with radium, and within five months all evidence of disease had vanished from the parts which looked and felt normal

As a result I determined to purchase radium element of my own, which was inserted into needles of different lengths, containing the dosage and filtration I required.

Armed with these preparations I devoted myself chiefly to the interstitial radiation of malignant tumours.1 Since that time my success has been very encouraging Three squamous epitheliomas of the lip have entirely disappeared. An ulcerating epithelial tumour involving the soft palate, left anterior pillar of the fauces, the alveolar margins of the upper and lower laws, the floor of the mouth and the side of the tongue in a man aged sixty-two years has disappeared, a squamous epithelioma on the floor of the mouth m a man aged seventy-two has also disappeared is no sign of any continuation of growth in any of these cases so far They range from five to eight months freedom of disease. It is too soon to make further deductions from these results Interstatual radiation was employed in all these patients except External radiation was applied by means of a denture, worn night and day, over the alveolar margins of the upper and lower laws in the extensive carcinoma in the mouth Alveolar margins of the laws are not suitable structures for interstitual radiation

I have also interstitially radiated (without reinforcing the treatment by means of external radiation) seven carcinomas of the breast. Four are still under observation with softening and disappearing tumours, the tumours in two have disappeared, and in the seventh a smooth, soft irregularity could still be felt in the situation of the lump five months after radiation This portion of the breast was removed and the parts were subjected to a cytological examination, the result of which is described below (Case 2) It was the first breast carcinoma in which I used my own radium needles, the tumour was small, and the result of the investigation shows, I believe, that a longer radiation than I gave the breast (17,000 milligramme-hours) should have been given to this radio-resistant tumour There were not any enlarged glands in the axilla and the

skin was only just puckered over the tumour. The patient refused operation. The time that has elapsed since radiation of the other six breasts is too short to draw definite conclusions

My experience is enough to convince me, just as Mr G. L Keynes is convinced, that in radiation there is a therapeutic agent of valuable potentiality in the treatment of breast carcinoma. Although we are in possession of a therapeutic agent of such power and promise there is not any definite indication of the exact morphological and bio-chemical effects it has on the tissues to which it has been applied. it is not known if the action exerted upon tissues by interstitial radiation is the same as the action of external radiation If the action of external radiation on tissues has a different influence to that of interstitual radiation, and the probability of there being a difference in action is great, then the tissues that are interstitually radiated are subjected to two different actions, namely, that of interstitial radiation and also that of external radiation The action induced by external radiation would not be interfered with merely because the radium was acting interstitially as well Enough is not known even to speculate what the difference in action may be

Again, a declared dosage of so many miligramme-hours is valuable chiefly on account of its description of the dose of radiation a patient has received. This description of dosage does not imply that the tumours alone received that amount of radiation. I am trying to discover an accurate means of recording the distribution of the dose to the actual parts that are radiated. So far it seems most satisfactory to make a diagrammatic representation of every case and accurately describe the dosage of each particular part. Further, it is not known whether the injurious action upon tumours of either interstitial or external radiation.

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affects chiefly the malignant cells, or whether regression of the tumours is indirectly due to changes induced in the surrounding tissues. The results of morphological observations upon the radiated tissues do not appear definitely to settle these points, and even if they adduced definite evidence they would naturally be considered to have been based upon an insufficient number of cases to ment general application.

In these circumstances I may be excused for recalling attention to many remarkable distributions of rodent ulcer which were definitely associated with, and at all events temporarily limited to, normal nerve areas have to thank the editorial staff of the British Medical Journal for publishing, in 1903 and after, a series of illustrated articles which did not at the time possessnor did they seem to have a prospect of possessingan immediate practical value, but are new beginning to attain some importance in connection with the effect that radiation of the surrounding tissues has upon the growth of malignant cells In the examples I gave of rodent ulcers spreading rapidly in all parts except at certain margins, the particular interest lies in the fact that they showed that normal untreated tissues exhibit parts into which spread of rodent ulcer does not occur, when spreading is occurring everywhere The reason that rodent ulcers afford examples of arrest at certain lines, evidence of which is almost absent in squamous epitheliomas, is that rodent ulcer does not metastasize like the other malignant tumours, but advances at its periphery, which maintains its continuity with the main parts of the tumour arrest that takes place at the margin of some rodent ulcers while the disease is spreading in all other directions cannot be due to a change in the tissues surrounding the encroaching tumour cells The environment is the same—namely, the skin. The arrest of a rodent ulcer cannot be compared to the latency of

malignant cells in a lymphatic gland and their ful-minating growth in the liver of the same patient. In these examples the environments are different Nor can it be compared to the thirty-one years' latency of breast carcinoma cells when they have reached the skin, and which after that long period suddenly erupt as a cancer en currasse. In this instance latency could be explained by the presence of either a local or systemic cause. The arrest of a rodent ulcer's spread at certain margins cannot be accounted for by a change of environment, since the arrest occurs in the tissue in which it began and in which it is spreading in all other directions, namely, the skin Neither can a local area of arrest m rodent ulcer be explained by its being due to a systemic cause when the disease is spreading in all other directions. There is some unknown influence m operation at the arrested edge that cannot be accounted for by any known hypothesis The lines of arrest correspond to the boundaries of nerve areas in the skin. Microscopical sections made from the edge at which arrest occurred do not show any sign of mechanical obstruction nor any appearance that suggests a cause of the arrest. The tumour at these arrested margins does not exhibit any difference morphologically from the tumour at the margins where the disease is in the act of spreading. Neither can the arrest be explained by any haphazard suggestions that have been made, such as blood vascular supply, or the distribution of lymphatic vessels Blood vascular anastomosis in the skin is too perfect to account for an arrest of growth due to that cause, and the growth is arrested at parts where lymphatic flow would be more likely to encourage spread than resist it. The examples of rodent ulcer I published afford a definite indication that there is some influence in operation in normal untreated tissues which resists the direct spread of a rodent ulcer. At the time of

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publication, I suggested that the influence was connected with the nervous system, since then W Cramer has produced experimental evidence that coincides with my clinical observations ² Neither can lymphatic and blood vascular distributions explain why tuberculosis of the face usually affects the so-called "butterfly area," and that tertiary syphilis, rodent ulcer and squamous epithelioma seldom occupy that region, but as a rule affect and spread themselves in the naso-labial region described by Sir Henry Head The fact that there is this difference between the areas occupied by these diseases affords a trustworthy feature in diagnosis

The question arises has radiation any influence upon this normal action or has the detrimental action of radiation upon surrounding tissues no relation at all to the action of normal tissues, but is it one of a completely different character? The observations of W Cramer³ and J C Mottram⁴ demonstrate that the surrounding tissues are acted upon by radiation and



Fig A.—Uninjured epidermis and damaged cancer cells after interstitual irradiation of a case of lip carcinoma (Case 1)

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that this reaction is contributing to the regression of the tumour. These statements are not intended to convey the idea that radiation does not affect the malignant cells as well

Very little attempt has as yet been made to study the morphological effects exhibited by radiated malignant cells and also the normal tissues among which they have spread. There is a great deal of important work to be done in this direction. We have had this object in view in making cytological examinations of the radiated tissues, the result of which are described below.

CASE 1 IRRADIATED LIP CANCER

The most striking feature of this case is the relatively insignificant effect of the irradiation on the normal epidermis, and the extensive injury to the cancer cells. On the left of Fig A is seen a part of a downgrowth of the epidermis, which, except at the top, is surrounded by the damaged malignant cells, infiltrated with polymorphs and cells of the lymphocyte series. A similar

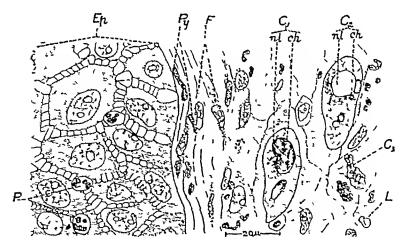


Fig B—Semi-diagrammatic figure showing on the left the normal epidermis (Ep) of the lip, on the right cancer cells damaged by interstitual irradiation (Case 1) C₁, C₂—cancer cells, ch—chromatim, and nl—nucleoli of cancer cells, F—fibroblasts, L—lymphocytes, Py—pycnotic nuclei, P—polymorphonuclear leucocytes.

microscopic field is represented scmi-diagrammatically in Fig'B On the left is the squamous epithelium (Ep), with several polymorphs (P) amongst the intercellular bridges. To the right of this figure

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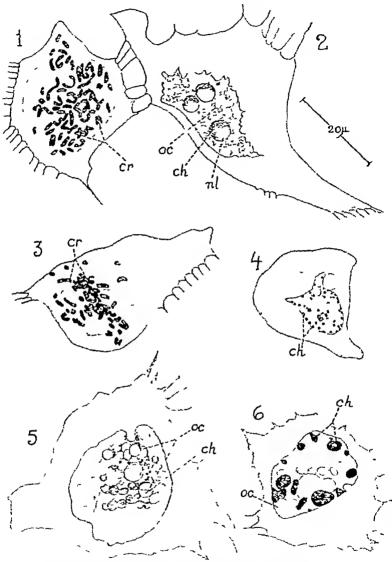


Fig C-Malignant cells of the irradiated lip cancer (Case 1)

- 1 Prophase of mitosis with more than the normal number of chromosomes (cr)
- 2 Hypertrophied cell with most of its chromatin collected in the nucleoli (nl)

Abnormal multipolar mitosis

4, 5 and 6 Cells showing various forms of nuclear degeneration Ch—chromatin (basi-chromatin), demonstrable by Feulgen 8 method for thymus nucleic acid protein complexes

Oc-oxychromatm Cr-chromosomes nl-nucleolus

are two hypertrophied cancer cells (C1 and C2), another one (C3) is The two former cells show what is specially characteristic of the cells of this radiated cancer—a curious irregularity in the distribution of the chromatin (ch) of the nuclei In one cell (C1), it is almost entirely confined to the nucleoli (nl), while in the other (C2) there is relatively little chromatin in the whole of the The greater part of the nucleus is made up of what is nucleus usually called the oxyphil substance, or oxychromatin called owing to its stainability with acid aniline dyes It fails to stain by the Feulgen method for thymus-nucleic acid, unlike the The latter is often spoken of as basi-chromatin, true chromatin owing to the way in which it stains with basic dyes. A few granules of basi-chromatin (ch) are seen in the cell C.

Further pecularities in the chromatin content of the cells of this irradiated cancer are shown in Fig C, Nos 2, 4, 5 and 6 The hypertrophied cell, shown in No 2, has an irregular shaped nucleus, the chromatin (ch) (basi-chromatin) of which is contained within the three nucleoli A similar greatly enlarged cell is shown, marked x in Fig D

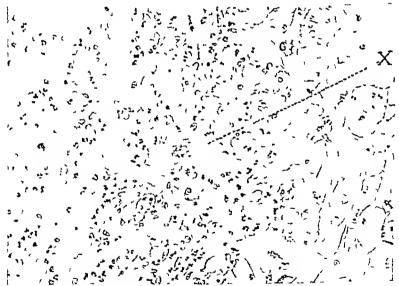


Fig. D.—Irradiated lip carcinoms showing greatly hypertrophied cancer cell (X) and small celled infiltration (Case I)

In the cell of Fig C, No 4 the chromatin (ch) has collected into droplets immediately beneath the nuclear membrane. The enlarged cell of No 5 has a lobed nucleus containing numerous droplets, which for the most part fail to stain by Feulgen's method for true chromatin. A few droplets however do give this reaction (ch) as do certain areas of the others shown by the dotted areas in the figure

Fig C, No 6 shows what is regarded as the ultimate stage of the

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separation of the true chromatin (ch) from the oxy-chromatin (cc). The nucleus contains a large number of separate droplets of each kind. This form of nuclear degeneration after irradiation is unusual. It has not been observed during autolysis of tumour cells.

Although the majority of the cells of this irradiated new growth show varying degrees of hypertrophy and irregularities in the distribution of the chromatin, yet a few look relatively unaltered. That they have not all undergone fatal injury is shown by the presence of various phases of mitosis. Fig. C, No. 1 shows a cell at late prophase at the time when the nuclear membrane is breaking down. Many of the chromosomes (cr.) show a definite longitudinal split which is frequently seen in actively growing tumour cells at this stage. It was not possible to count accurately the number of chromosomes in this cell. but they were undoubtedly in excess of the normal number. What is apparently an abnormal multipolar mitosis is seen in No. 3. This is clearly pathological. The



Fig E -- Mammary caremoma after irradiation (Case 2)

chromosomes are irregularly arranged and many of them are fragmented but the longitudinal split is still obvious in others

CASE 2 IRRADIATED BREAST CASE

The nodule showed on histological examination a dense mass of connective tissue with centres of necrosis and scattered groups of tumour cells. Fig. E shows an area which presents the appearance of a typical scurhous mammary carcinoma. The tumour cells show no obvious abnormalities. There are very few mitoses but significance cannot be attributed to this fact since untreated

tumours of the same type have been found to show remarkably few mitoses. Towards the right-hand side of the figure some necrotic patches are seen. The cells immediately surrounding such areas show degenerative changes. The greater number of the cells, however, have the normal nuclear structure and their cytoplasm frequently contains products of secretory activity.



FIG. F.—Small area of a rodent ulcor unaffected by irradiation (Case 3)

CASE 3 IRRADIATED RODENT ULCER

This case was examined cytologically both before and after irradiation. The preliminary examination showed a typical rodent ulcer. After irradiation the greater part of the ulcer was destroyed. In order to ascertain whether any part of the original growth remained serial sections were cut of a longitudinal strip of the lesion. By this means one part on the margin was found where the rodent ulcer remained unaffected by the irradiation. This region is shown in Fig. F. The section from which the photomicrograph was taken was one cut somewhat obliquely to the surface of the skin. At the top right-hand corner are seen two hair follicles. To the left of these and also below them are the cell clusters of the rodent ulcer. The cells look no different to those of the sections made before irradiation. A few mitoses have been seen. The dermis shows an extensive

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small-celled infiltration consisting of polymorphs, lymphocytes, monocytes, polyblasts, macrophages and plasma cells

STIMMARY.

I have already stated that the observations contained in this article are too limited to admit a general application. Bearing this in mind it is interesting to summarize the result of Dr. Ludford's cytological examination of the lip case (Case 1) .-

- (1) The comparative freedom from the effects of radiation of the normal epithelium, although it was in the area of 1 cm round a needle containing 2 milligrammes of radium for eight days
- (2) The radiations appear to have had a specific action upon the malignant cells All the cells were within an area of 1 cm of the source of radiation.
- (3) A large proportion of malignant cells have not been actually destroyed. Many of the undestroyed cells are so degenerated that they may not recover are other malignant cells which may either recover or may never become capable of multiplication, having lost their malignant character.
- (4) It cannot be said that radiation had increased the number of lymphocytes, polymorphs or macrophages in the radiated area, since precisely similar pictures can be seen in unradiated squamous epitheliomas of the lip
- (5) The type of degeneration induced by radiation of the malignant cells is an unusual one
- (6) Abnormal mitosis has actually occurred during the radiation.

We are indebted to Mr. F. J. Pittock, of the Department of Embryology, University College, for the photomicrographs illustrating this paper

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Ultramicroscopic Viruses.

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E owe to the botanists the first proof of the existence of ultramicroscopic viruses. In 1892, Iwanowski, who had searched in vain for a visible microbic agency in mosaic disease of the tobacco plant, filtered the juice of an infected plant through a bacterial filter, and found that the filtrate was infective for normal healthy plants. Seven years later, these observations were independently confirmed by Beijerimck

The first animal disease discovered to be caused by an ultramicroscopic contagium was foot-and-mouth disease of cattle The discovery was an accident of research Loeffler and Frosch (1897) were engaged in the study of immunity reactions, and desiring to remove formed elements from vesicle fluid, they filtered the fluid through a Berkefeld candle, the filtrate, now devoid of cells and of bacteria, retained unimpaired its power to cause foot-and-mouth disease in susceptible At first, Loeffler and Frosch imagined the active principle which passes through the candle to be They attempted to titrate the toxin vesicle fluid was diluted 15,000 times, and a unit was injected into a calf weighing 200 kilogrammes calf developed foot-and-mouth disease Thus, 1f, as was found justifiable, the "toxin" was evenly distributed through the calf, it was found that one part of filtered vesicle fluid to 3,000,000,000 parts of calf was active The filtrate, it was calculated, was more active than the most active toxins then known Loeffler and Frosch concluded that the agent in a filtrate is not of the nature of a toxin, but is a multiplying agent—a living organism Moreover, a calf infected with filtrate

develops foot-and-mouth disease in a normal manner, and, from such a case, vesicle fluid may again be obtained, may be diluted, filtered and the filtrate used again as an infective inoculum. The agent which passes through the filter is thus able to multiply indefinitely in the bodies of susceptible animals. It is invisible under the microscopes at present in use, but this, as Loeffler and Frosch realized, constitutes no objection to the conclusion that the agent is a formed living thing

These primary discoveries opened up new paths to bacteriological investigators Numerous diseases of obscure ætiology were re-examined in their light As a consequence, more than a hundred diseases of plants and animals have now been shown to be caused by ultramicroscopic viruses, and each year sees the list extended Among human diseases are many contagious fevers such as smallpox, measles, and fevers which are carried by insects, e g yellow fever Among diseases of the inferior animals caused by viruses are foot-andmouth disease, swine fever, canine distemper, cattle plague, and many others which are responsible for enormous economic losses Apart, therefore, from the scientific interest which viruses arouse—sufficient in itself to warrant determined efforts to advance our knowledge—there is a practical importance attached to studies of viruses which is universally recognized the present time, bacteriologists are confronted by problems in the study of the viruses of the same order as those which the early bacteriologists faced in relation civilized country to solve the problems involved in the cultivation of viruses and in the elucidation of immunity reactions, and it cannot be doubted that laboratory technique is slowly advancing towards that mastery which enables us to handle, cultivate, and see the relatively large microbes of such diseases as tuberculosis

and typhoid fever

"Ultramicroscopic virus" and "filterable virus" are the commonest terms in use to designate these very small disease agents Neither term is satisfactory The word ultramicroscope is used properly in describing the instrument devised by Tyndall to determine whether a given space is optically empty or not It is wrongly applied in association with virus, since it implies that the viruses are visible and resolvable by means of the ultramicroscope Now, the ultramicroscope does not indicate shape or "resolve" sizes in the microscopic sense The use of the word filterable in association with virus is objectionable, in that it implies that all viruses are filterable and that other bacteria are not This, however, is not so Some viruses are not filterable, and some bacteria are For example, the leptospira of Weil's disease will pass through Chamberland candles L_2 and L_3 with ease Of other terms which are used for viruses, some are devised to indicate some relatively common characteristic, such as the formation of intracellular inclusion bodies Chlamydozoa is such a term Since, however, such inclusion bodies are not found in all virus diseases, the term is obviously unsuitable would be satisfactory if the simple term virus were retained for these invisible contagia

FILTRATION OF VIRUSES

Some viruses pass through filter candles with the greatest ease. The best example of this type is foot-and-mouth disease virus. Here, as has already been stated, the vesicle fluid, which is rich in virus, is diluted with saline, and the mixture filtered. There is no appreciable loss. Others are filtered with difficulty. All attempts to filter vaccinia virus failed until quite recently. It has now been found by Dr. Hugh Ward, formerly of Oxford and now of Harvard University, that if, instead of diluting vaccinia pulp

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with saline it is diluted with broth, filtration can be accomplished Thus, a suspension of vaccinia virus in broth passes through a Berkefeld candle, whilst an equal suspension of the virus in saline is held back The broth, apparently, in some way "lubricates" the pores of the candle This difficulty of filtering vaccinia virus has been overcome by Dr H Yaoi in another way Yaoi passes an acid solution of white of egg through a candle, and then filters the suspension of vaccinia virus, the white of egg renders the candle permeable to the virus Using the same technique, A C Marie and A Urbain's have succeeded in filtering the virus of rabies This principle of filtration, the "lubrication" of the filter candle, has been studied by a number of physicists—It has been found, for example, by Elford that an aqueous solution of the dye "night blue" will not pass quickly through a Chamberland L₂ candle If, however, a solution of soap is first filtered through a candle, then afterwards the candle, now saturated with soap salts, allows "night blue" to pass readily It is clear from these examples that the process of filtration is not a simple separation of particles of different sizes, it is, indeed, a very complex process, as yet only imperfectly understood

As an illustration of the influence of the composition of the medium upon the results of filtration tests, the following experience with the Rockefeller Fowl Sarcoma No 1 may be taken. When 4 grammes of this tumour is taken and is broken up with sand or with capillary glass tubing, and then diluted with 100 c cm of saline, the resulting tumour extract, after spinning to deposit sand and tissue debris, yields an active filtrate when passed under low pressure through a Berkefeld candle. The first few cubic centimetres of filtrate are inactive—the candle apparently absorbing the virus to some extent—but later portions

are active to a variable degree. Now, if instead of taking 4 grammes of tissue to 100 c cm of saline, 10 grammes or more are taken, it will be found that filtration is rather more difficult, and that the filtrate is usually quite innocuous. In an example of filtration of this kind, where all that is required of the process is the exclusion of intact living cells, it has been found that filtration through layers of paper pulp and sand yields cell-free filtrates many times more active than filtrates through candles. A candle in such a case absorbs 80 to 90 per cent of the virus

A filter candle, then, though of great practical value in separating viruses from animal cells and from contaminating bacteria, gives no precise information either as to the size or the nature of a virus Numerous attempts have been made to devise and standardize collodion filters, which, both on account of the essential properties of collodion and of the shortness of the track through which the particles pass in filtration, might give some information of the size of individual virus particles This kind of investigation has been pursued with great thoroughness and care by Mr Barnard and Mr Elford, who have adapted Bechhold's method of preparing collodion filters This consists in impregnating filter papers of a proper quality with a solution of guncotton in glacial acetic acid The collodion forms a thin even film, filling up the interstices of the filter paper The filter thus prepared is fitted up in a special form of filtering apparatus, arranged in such a way that pressure of variable degree can be applied during determined intervals on both sides of the filter such means it has been found that a direct relationship between the size of particle which will pass the filter and the degree of dilution of guncotton in the acetic acid solution exists Particles differing in size from 0 02 to 0 05 micron can be separated from one another but how far the results which are obtained when lifeless

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particles are filtered can be applied to the results of filtration of living viruses is a little difficult to estimate. The sizes of viruses as determined by such methods are round about 0 015 micron, but such estimates, it is realized, are not likely to be very accurate.

It is assumed in all such investigations that viruses are particulate, corpuscular in form The final proof that this is correct depends upon advances in optical methods and the discovery of a method of revealing the form and shape of the individual virus particle Extremely divergent opinions or, perhaps it would be just to say, speculations, have been advanced on this Whilst most investigations are pursued on the hypothesis that viruses are corpuscular, some writers have gone so far as to regard a virus as an animate liquid, a contagium vivum liquidum is no evidence in support of this extreme view, but, as will be shown later, views intermediate between what may be termed the orthodox bacteriological view of viruses as particulate bodies and the extreme view of a contagious fluid have been put forward Attempts to settle the point by the use of the centrifuge have been numerous If, it might be argued, a virus can be "shifted" by means of gravity, then it is probable that the virus exists as discrete particles The difficulty in all such work, however, lies in the fact that viruses are prone to become attached to colloidal masses, protein or otherwise in nature, and that, consequently, in spinning down the large masses, the virus is carried down mechanically If the fluid containing virus is first cleared by filtering through a close candle, and the filtrate, in which presumably the virus is suspended as discrete particles, is spun, then it is found that the speed of rotation must be so largely increased that soluble proteins are said to "shift" Although no strict proof of the particulate nature of viruses can, therefore, be obtained by such methods, it may, never-

theless, be said that the balance of evidence is in favour of the view that viruses are particulate, since by means of a rapid centrifuge, virus in a filtrate can be concentrated in the lower layers of fluid. This is true for the bacteriophage, for herpes virus, and for the virus of the Rous Sarcoma No. 1

THE CULTIVATION OF VIRUSES ON ARTIFICIAL MEDIA

If it were possible to cultivate viruses on artificial media, and with subcultures reproduce the disease for which any given virus is responsible, then not only would the question of the real nature of viruses be solved, but probably also a rapid increase in knowledge would follow This, however, has not yet been achieved, except in one case The exception is the virus of bovine pleuro-pneumonia This organism was first cultivated by Dujardin-Beaumetz It grows easily in horse-serum broth and on horse-serum agar The serum must be heated to 55° C for half an hour to destroy complement, or, alternatively, serum which has been stored for many weeks may be used Fresh horse serum is inhibitory to the growth. Indeed, some examples of horse serum in the fresh state are actively virucidal to the organism Growth in liquid medium causes the formation of a delicate opalescence Colonies on serumagar are exceedingly small and translucent, not easily seen except under a hand lens or by the use of a dissect-ing microscope It is very difficult to reveal organisms in films of cultures, either from liquid media or from surface cultures After a long experience in attempts to stain and examine the organism in this way, the author is doubtful whether it is possible to exhibit the stained organism by direct microscopy ordinary dark ground microscope a preparation from a serum broth culture shows innumerable particles which, however, are not resolved sufficiently well to enable the form of the organism to be described With

ee that the virus consists of a relatively large which are attached by incredibly fine threads particles of such a small size that they are he resolution limits attainable with visible hen, as has been achieved by Barnard, ultraat is employed, the form and character of the articles, which are probably the virus itself, led The organism of bovine pleuro-pneumonia close-grained candles, e g Chamberlain L2, easily Filtration experiments with collodion proved that the virus particles are of the same size as the viruses of other diseases In spite well-proved observations, it is not usually that the pleuro-pneumonia organism belongs lass of viruses, it is commonly classed with bacteria The reason for this hesitation to e organism among the true viruses is difficult stand, but it is probably because the organism cultivate, and because, like ordinary microbes, definite biochemical fermentation effects on sugars, a property not possessed by other Nevertheless, it is more in accordance with s to regard the organism of bovine pleurona as a cultivable virus er viruses some have been shown to multiply in ence of living tissue The best known of these 11a virus Here it has been shown by H B d and M C Maitland, of Manchester, that virus multiplies in a medium of Tyrode's solul blood serum to which a fragment of fresh as been added Growth of virus here depends e presence of living cells in the medium ney cells are first killed by alternate freezing wing, then, as has been shown by Harde⁵ and rs and Muckenfuss, multiplication of virus no akes place The living kidney cells apparently 515

ard's dark ground condenser it is easy, how-

either provide some pabulum for growth or establish some conditions of a physical or chemical kind essential to the growth of the virus, or, alternatively, the virus grows within the kidney cells, and, as the cells die, is liberated

Since it is probable that the majority of pathogenic viruses are obligatory cell parasites, the solution of the problem of cultivation of viruses may depend upon the growth of knowledge of the chemical and physical conditions of the interior of cells Recent observations by Muckenfuss and Rivers have shown that vaccinia virus does not survive long in a medium which contains dead kidney cells, nor in a medium which is separated by a collodion membrane from living kidney cells however, the conditions are combined, i e the virus is inoculated into a medium containing dead kidney cells, and the medium is separated by a collodion film from living kidney cells, then the time of survival is increased The observers of this unusually interesting phenomenon are cautious in their conclusions, and anxious that the experiments should be repeated by others, but it does appear that a definite advance towards an understanding of the conditions necessary for the growth of vaccinia virus is here foreshadowed It is an example of the persistent international effort now being made to solve the primary problems of viruses

ARE VIRUSES LIVE OR DEAD AGENTS?

In all that has gone before it will have been observed that research has been governed by the hypothesis that viruses are incredibly small living microbes. This general hypothesis is fully justified by the knowledge so far gathered, but, since final proof of its truth depends upon the cultivation of more than one typical virus—which has not yet been achieved—plenty of scope is left for general theorizing. The general character of such theorizing was laid down by Sanfelice, who,

finding that the virus of fowlpox resisted the action of 1 per cent sodium hydroxide, was led to propound the theory that the virus is an inanimate poison manufactured by living tissue cells, capable of attacking normal cells, which in turn produce more of this poison. In this way a lifeless agent, the "virus" might simulate multiplication. But, whereas the multiplication of viruses within the bodies of affected animals and plants is naturally explained by the hypothesis that viruses are living things, the explanation afforded by Sanfelice's and kindred hypotheses is strained and unrelated to natural phenomena

The question may be examined in a general way. The property of multiplication in vivo may be set aside, since this primary fact is the first which any hypothesis of the nature of viruses must explain in order to be acceptable. A sound hypothesis must embrace a multitude of other established observations. Smallpox virus becomes vaccinia virus after passage in calves the virus becomes altered and adapted to life in the calf, contagious epithelioma of fowls can be adapted to pigeons, mosaic virus of tobacco to the cucumber. The property of adaptation is characteristic of living things, and its exhibition by viruses is not easily explicable on any hypothesis except that of the independent living nature of viruses.

Viruses are acted upon by antiseptics in the same sort of way as are the large cultivable microbes. Some are exceedingly sensitive to one antiseptic, resistant to another. These facts are difficult to reconcile with the view that viruses are inanimate poisons elaborated by cells.

The highly contagious diseases offer almost insuperable difficulties to the theories of Sanfelice and his followers. Canine distemper, for example, affects ferrets as well as dogs, the infection spreads easily from one species to the other. On the hypothesis that the

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virus of distemper is a "poison" or "toxin" manufactured by the cells of an affected animal, it is very difficult to believe either that a product of dog cells can be taken up so readily by ferrets, or that it can cause the cells of the ferret to start the manufacture of the same "poison". It is even more difficult to reconcile this hypothesis with the fact that distemper does not arise de novo, that is, that each case is always connected etiologically with some other case of the disease. During the past seven years, the Medical Research Council and the Distemper Fund have maintained a stock of dogs in strict isolation, no case of distemper has arisen among them. Now, if distemper virus were a product of dog or ferret cells. It is almost certain that the "product" would arise spontaneously from time to time.

All these remarks apply with equal force to other contagious diseases, such as foot-and-mouth disease, but the insufficiency of the hypotheses which explain viruses as "poisons" generated in the cells of afflicted animals is best illustrated by the disease yellow-fever. Here we have a virus disease in which the contagion is spread by mosquitoes. The virus taken by the mosquito from the human being remains in the body of the mosquito for a week or more, and is then able to set up yellow-fever infection in a healthy man. It is inconceivable that a portion of a human cell, or a "poison" made by a human cell, can be taken up by a particular species of mosquito, exist unchanged for many days, and remain infective for man. In malaria, living organisms pass from man to mosquito and back again, and we are able to conceive the same process even in cases where the disease organism is ultramicroscopic

There are not any general observations, clinical, epidemiological or experimental, which nullify the theory that viruses are living organisms or which, alternatively, support the view that viruses are inanimate

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poisons derived from cells How comes it about, then, that the question as to the real nature of viruses is so frequently under debate? The reason, no doubt, is partly because strict proof of orthodox bacteriological theory is so difficult to obtain, and partly because of the fascination of theorizing on a subject which owes much of its attractiveness to an apparent association with the insoluble problem of the nature of life itself "life" be manifested by an aggregation of molecules packed into the space occupied by a virus particle? or do viruses represent some stage of living matter intermediate between bacteria and lifeless ferments? same questions were doubtless asked when the microbes which we now recognize as living beings were first discovered Apart from the difficulty of seeing and cultivating viruses, there are no grounds for supposing that viruses are fundamentally different from other living organisms They do not, so far as can be determined. arise de novo, they do not readily change The viruses which cause diseases, e.g. measles, dog distemper, fowl plague, retain their characters from animal to animal apparently indefinitely

In recent years the discussion has been affected by the fact that a series of true malignant new growths has been shown to be caused by a filterable virus tumours, all of the common fowl, were first described by Dr Peyton Rous, of the Rockefeller Institute, New York Rous and his co-workers propagated and studied with meticulous care five such tumours, constituting three distinct types a simple spindle-celled tumour, a spindle cell tumour of a distinct type, and an osteochondrosarcoma The tumours differed not only in their structure, but also in their biological features, such as rate of growth and the sites and frequency of metastatic deposits. Since the primary observations of Rous were made, filterable tumours have been described in almost every civilized country by

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virus of distemper is a "poison" or "toxin" manufactured by the cells of an affected animal, it is very difficult to believe either that a product of dog cells can be taken up so readily by ferrets, or that it can cause the cells of the ferret to start the manufacture of the same "poison" It is even more difficult to reconcile this hypothesis with the fact that distemper does not arise de novo, that is, that each case is always connected etiologically with some other case of the disease—During the past seven years, the Medical Research Council and the Distemper Fund have maintained a stock of dogs in strict isolation, no case of distemper has arisen among them—Now, if distemper virus were a product of dog or ferret cells. It is almost certain that the "product" would arise spontaneously from time to time

All these remarks apply with equal force to other contagious diseases, such as foot-and-mouth disease, but the insufficiency of the hypotheses which explain viruses as "poisons" generated in the cells of afflicted animals is best illustrated by the disease yellow-fever. Here we have a virus disease in which the contagion is spread by mosquitoes. The virus taken by the mosquito from the human being remains in the body of the mosquito for a week or more, and is then able to set up yellow-fever infection in a healthy man. It is inconceivable that a portion of a human cell, or a "poison" made by a human cell, can be taken up by a particular species of mosquito, exist unchanged for many days, and remain infective for man. In malaria, living organisms pass from man to mosquito and back again, and we are able to conceive the same process even in cases where the disease organism is ultramicroscopic

There are not any general observations, clinical, epidemiological or experimental, which nullify the theory that viruses are living organisms or which, alternatively, support the view that viruses are inanimate

of malignant disease This doctrine, in one form or another, is embedded in modern medicine, and forms a starting point in discussions of filterable tumours is not always clearly expressed, but its influence on opinion is easily recognizable, almost always tending towards the conclusion that the filterable agent of a tumour is a ferment or other non-living product of the This conclusion is apparently supported by the extreme specificity of the tumour agents themselves, for, it must always be remembered, the active filtrate of a tumour brings about the formation of its own tumour alone, and of no other, a cell-free filtrate of an endothelioma always gives rise to an endothelioma, a filtrate of a fibrosarcoma to a fibrosarcoma, and so on over, the filtrates are specific only for fowls Thus the virus in each case carries the species and cell specificities of an actual cell, and it is therefore very difficult to believe that it is a living micro-organism. These facts, together with the general properties of new growthssuch as non-contagiousness of cancer, the apparent lack of association between different tumours and the extraordinary variety of histological forms of tumoursappear to be most easily explicable on the hypothesis that the virus itself is a cell poison, in Sanfelice's sense. manufactured by cells and causing cells of the same type, in the same species, to continue the manufacture An adequate analysis of observations and opinions on this subject is impossible here, but it may be pointed out that a prima facie objection to the Sanfelice hypothesis is the assumption of a cell mechanism by which the stimulus to production is a surplus of the productthe reverse of all that we know of cell activities all this belongs to the discussion of malignant disease and not to viruses, and may therefore be put aside far as the general question of the animate or inanimate nature of viruses in general is concerned, it is right to point out that the special properties of tumour viruses

Fujinami in Japan, Teutschlaender in Germany, Pentimalli in Italy, and Begg in England. The tumours described by Begg are of unusual interest one is a new growth of vascular endothelium, the other is a fibrosarcoma. The endothelium grows with great rapidity, forms metastases chiefly in the liver, spleen, and the lymph glands of the neck, and kills the host in from three to five weeks. The fibrosarcoma grows very slowly—an ordinary graft of 0.02 c cm usually takes more than a year to grow to the size that a rapidly growing tumour, e.g. Rous tumour No 1, attains in fourteen days—and metastasises rarely. All these tumours are transmissible, with variable success, by means of cell-fiee filtrates, and are therefore caused by filterable viruses.

Before entering upon the discussion of the effect which these discoveries in cancer research have had upon general opinions as to the nature of viruses, it would be well to state that the filterable tumours differ in no wise from tumours of mammals, except in this one property of filterability. It is common to hear in medical discussions, and to read in medical journals, the opinion that filterable tumours are not true new growths, usually all such tumours are referred to as "the Rous tumour". The expression of such an opinion betrays ignorance of some of the most careful work ever carried out in the history of pathological science.

In what way are opinions on viruses affected by the facts relating to filterable tumouis? The answer to this question is found partly in the history of cancer research and partly in the specific properties of the tumour viruses. The historic doctrine that the cancer cell is a "perverted" or "distorted" normal cell endowed with an unlimited, unregulated capacity of multiplication, excludes the idea of a persisting, continuously acting microbic agency as the essential cause

ULTRAMICROSCOPIC VIRUSES

There are thus some peculiarities associated mixture with immunity problems which have not yet been explained It is possible that the immune—or, as they are usually termed, virucidal—sera are, in reality, antitoxic, but it has not yet been possible to prove this

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ought not to sway unduly the balance of opinion as regards the invisible contagia of the infectious fevers

IMMUNITY IN VIRUS DISEASES

An attack of a disease caused by a virus is followed by an immunity, evanescent or solid, just as in diseases caused by larger micro-organisms. In smallpox, chicken-pox and measles, the immunity left is permanent, in foot-and-mouth disease, the immune state lasts about a year. In those diseases which leave a lasting immunity, it is possible that the explanation of the resistant state is the persistence of the virus in the animal body. This phenomenon, the "carrier" state, has been proved with the salivary virus of the guineapig

The induction of the resistant state by artificial procedure is now a routine of practical medicine. Usually the method employed consists in killing—or if the word "kill" be inadmissible, of inactivating—a virus by the application of phenol, or formalin, or other antiseptic, and of injecting such inactivated virus subcutaneously Viruses which are inactivated by heat usually fail to evoke immunity responses an injection of inactive virus, a large dose of living virus is administered The resistance induced by the dead virus is sufficient to enable the animal to deal with the subsequent injection of living material A solid immunity is thus set up The immune state can often be detected by common laboratory tests Thus the serum of the animal is able to neutralize living virus, and, in some cases, possesses the power to fix comple-In those cases in which immune serum neutralizes virus, the neutralization does not depend upon destruction of the virus This has been demonstrated for fowl-plague by Dr C Todd's and for vaccinia by Dr C H Andrewes, 10 both of whom have shown that active virus can be obtained from a neutral

from Miller and Jones 3

Sex—In the 15 cases under review there were 10 males and 5 females, this incidence being in accordance with the accepted view of most authors that the condition of pulmonary neoplasm is much more frequent in males than in females. In 175 cases reported by Duguid⁴ 151, or 86·3 per cent, were males, and 24, or 14 per cent, females. Other observers hold the view that the frequency of incidence approximates to three males to one female.

Age—In the 15 cases mentioned the ages of the patients ranged from 16 to 67 years, the heaviest incidence being over the age of 36. This would support the views expressed by other observers Duguid⁴ has shown that in a series of 173 patients, 142 were above the age of 36 years

Occupation —There was not any special occupational incidence, and as all the cases were seen at Hospital or Out-Patient Departments, the majority were among the labouring classes

Symptomatology — The diagnosis of pulmonary neoplasm is by no means straightforward, and although the condition has been suspected in other patients coming under observation, only definite cases, with a subsequent confirmation of the diagnosis, are included in this review. The methods used in establishing the diagnosis are those of ordinary medical examination Careful notes were taken in regard to the onset and course of the symptoms, followed by clinical examination together with special methods of diagnosis, e g X-ray examination and lipiodol injections. all other conditions a detailed history is necessary, and an analysis of the 15 cases selected reveals the most prominent symptoms to be pain, cough and dyspnœa The pain in the chest was of a dull generalized type tending to become more marked on the affected side of the chest, it was constant and did

Intrathoracic and Pulmonary Neoplasms.

By J REGINALD BEAL, MD, DP.H Assistant Tuberculosis Officer, City of Manchester

HE increase, apparent or real, in recent years of the number of intrathoracic neoplasms, more especially of carcinoma of the lung, prompts the publication of a series of 15 cases under my notice during the past few years At the same time it may be of interest to record the more prominent signs and symptoms of the cases, together with the time and frequency of their occurrence It has been suggested that in recent years there has been an increase in the incidence of pulmonary cancer, Davidson1 stating that the percentage incidence of pulmonary cancer, in comparison with that of all forms, has risen considerably, and that this is definite evidence of the increase in lung cancer not only absolutely but relatively. This would also be substantiated by the observations of various continental authorities relation to the incidence of pulmonary cancer cancer as a whole This is shown in Table I

Table I

Proportion of Lung Cancer to all Cancer

_		Per cent	_	Year P	
Zurich	1906-1910	1 13	Jena	1910-1914	2 2
(Probst)	1911-1915	3 34	(Berblinger)		
,	1916-1920	612		1920-1924	8 3
	1921-1925	7 17			
	1926	7 56	Berlin	1917-1922	60
			(Wahl)	1922-1927	13 0
Leipzig	1920	6 6	, ,		
(Hueck)	1921	56			
(1922	11 7			
	1923	11 11			

These figures are quoted from Huguenin² and also 524

PULMONARY NEOPLASMS

The Physical Signs presented by these cases vary according to the position of the lesion Impaired note and impairment of movement were presented by all the cases when first seen, and these two signs would appear to be of great significance in the diagnosis. The extent of the dulness depends to a great degree on the proximity of the growth to the chest wall. Similarly, when the growth obstructs the bronchus the portion of the lung involved collapses, giving rise to dulness on percussion Breath sounds were diminished to absent in the majority of the cases and in only three cases was there sufficient effusion present to account for their absence. sign appeared to be due to obstruction of the bronchus and subsequent post-mortem or X-ray examination confirmed this Rhonchi were present in seven cases, and bronchial breath sounds occurred in 10, this feature being found to be due to excavation behind an obstructed bronchus, or compression of lung tissue The frequency of signs presented is shown in Table III.

TABLE III

Impaired movement	-	-	-		15 cases
Impaired percussion note	-	-	-	-	15 ,,
Absent breath sounds	-	-	-	-	9 ,,
Bronchial breath sounds	-	-	-	-	10 ,,

From this it will be seen that the association of impaired note and movement with absence of breath sounds, together with the history, are very suggestive of pulmonary neoplasm

The neoplasm was situated on the left side in ten cases and on the right side in five. Six cases had extra-pulmonary signs. Pleural effusion occurred in three and on exploration blood-stained fluid was withdrawn in one case. Pleural effusion and enlarged lymphatic glands in the neck and axilla were present in two cases. Supra-clavicular glands and cedema of the arm were present in four cases, and in one

not vary much, and unlike the usual pleuritic pain, was ununfluenced by breathing. When pain was not a primary symptom it very soon became prominent as a secondary phenomenon. Cough with expectoration occurred as the first symptom in the great majority of cases and was of an irritant type. Expectoration was scanty and only became profuse when there was breaking down of lung tissue. It was streaked with blood in only three cases, and in all the cases under review, when examined for tubercle bacilli, the result was negative. Contrary to the general opinion, dyspnœa was present as a primary symptom in only one patient, but very shortly it became prominent in the majority of cases and was of an advancing type

An attempt to show the progression of symptoms, their incidence, and the order of their appearance, is made in the following table.—

TABLE II

					Primary symptom	Secondary symptom	Tertiary symptom
Cough	-	-	-	-	8	6	
Pam	-	-	-	-	в	5	1
Dyspne	a	_	-	-	1	2	7

Progressive loss of weight occurred in 11 of the cases under review. The survival period of 10 cases known to have died ranged from a minimum of four months to a maximum of $2\frac{1}{4}$ years from the onset of symptoms. The period of $2\frac{1}{4}$ years in the longest survival is probably an over estimate, judging from the course the illness took whilst the patient was under observation. It will be seen, therefore, that the average duration of life from the onset of symptoms to the time of death, excluding the case mentioned above, would not be more than 1 year, the shortest survival period being 4 months, and the longest 1 year 3 months

PULMONARY NEOPLASMS

examination then demonstrated the underlying neoplasm. Another aid to diagnosis is now available in the intra-tracheal introduction of lipiodol followed by X-ray examination, and by this means obstruction to the bronchus is demonstrable. This method is illustrated in Fig. 2, which shows that the trachea is displaced to the right side and the left main bronchus



is occluded by pressure from the neoplasm in the left lung

Pathology—In this group of cases the nature of the growth was determined at autopsy or biopsy in ten cases. Of these cases nine were found to be carcinoma of the lung, and one was a derinoid cyst.

Conclusions - It would appear that the most im-

case there was a secondary deposit in the temporosphenoidal region of the brain, giving rise to bilateral homonymous hemianopsia and a hemiparesis

X-Ray Examination—In this series of cases 12 were submitted to X-ray examination, and in all cases the clinical diagnosis was confirmed As a means of distinguishing the type of neoplasm this method of examination is not of much value except



Fig 1 -Dermoid cyst

m such a rare instance as is shown in Fig 1, in which there was a dermoid, skiagraphy showed a dense shadow extending from the anterior mediastinum showing calcareous material,? dermoid At operation a dermoid cyst was removed, but the patient died of shock soon afterwards

In two of the cases with a pleural effusion masking the underlying lung, the fluid was withdrawn in both cases and gas substituted. The subsequent X-ray

PULMONARY NEOPLASMS

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Fig 2—Lipiodol injection showing obstruction to the left Bronchus is occluded by pressure from the neoplasm in the left lung

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portant factors in regard to the diagnosis are history of pain in the chest, associated with progressive cough and dyspnœa, and loss of weight. Repeated negative sputum tests are of value, and the occurrence of effusion in an elderly person should be regarded with suspicion. The occurrence of secondary phenomena, such as enlarged glands and ædema, whilst of great value in diagnosis, occur only as a later manifestation of pulmonary neoplasm

I am indebted to Dr Stanley Melville for the use of the radiograms.

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Chilblains:

Their Treatment by the Melted Paraffin Wax Bath and Ultra-Violet Rays.

By F HOWARD HUMPHRIS, M D, FRCPE, MRCS, DMRE

I N the treatment of chilblains, the aim of local treatment is to stimulate the peripheral circulation and to strengthen the superficial capillaries, and the two means which are offered by present-day physiotherapists, which produce an increase in the peripheral circulation lasting some hours, are the melted paraffin wax bath and ultra-violet rays

The melted paraffin wax bath was introduced into the modern practice of medicine by the late Colonel Littlewood during the latter part of the war Results of observations and tests have proved that this bath is of considerable therapeutic value in itself, and also as a preliminary for massage and other treatment, and its properties make it an important factor in the armamentarium of modern physio-therapeutics As to construction, the bath which I use, known as Ingleby's paraffin-electric bath, is made of fire-clay three inches thick (this is necessary to prevent radiation of the heat), it is 6ft long, with parallel sides, white glazed inside and over all, it is supported by four white glazed fireclay pedestals, and has a stoneware draw-off tap, and is fitted up with a self-contained electric heating apparatus and heat-regulating switch, this is fixed at the tap end of the bath, and keeps the molten wax in circulation The whole heating apparatus is enclosed in white enamel ironwork. Another bath of similar construction, but built vertically, is also used, and

smaller baths for the limbs have also been constructed, but in these it is difficult to regulate the heat satisfactorily on account of their smaller capacity

Paraffin wax is distilled from coal tar, wood tar or shale, and formerly the largest supplies came from Great Britain, at the present time, however, several other European countries, as well as America, are refining large quantities of paraffin wax. This is sterilized under super-heat, and thoroughly impregnated with a powerful antiseptic, which also gives it a refreshing odour. The manufacturers claim that the treatment employed in the final stages of the refining of this wax renders it peculiarly suitable for application to the most sensitive skin.

The melting point of this wax is 120° Fahr. It is practically non-inflammable, and certainly not more inflammable than butter would be. The wax is placed in the bath in large cakes and heated by two temporary coils of wire, when the wax is sufficiently heated, these may be removed, and the bath heated at will by the permanent heaters. The two wires lead from the terminals to the heater, and there is an earth wire. The cables used are 7/20's, and the current taken is about 8 amps at the maximum, down to about 3 and $2\frac{1}{2}$ amps

The patient remains with his hands or feet in the bath for about 20 minutes, at a temperature of about 120° to 130° Fahr The sensation is usually quite comfortable. At the end of this time the part under treatment is removed from the bath and allowed to cool After two or three minutes the wax can be quite easily peeled off the limb

Other conditions besides chilblains which I have found to respond to this treatment include neuritis, rheumatic and gouty joints, fibrositis, especially in and around small joints, scleroderma following old lymphangitis, cramp in the calf of the leg, intermittent

CHILBLAINS

claudication, eczema vesiculosum, phlebitis, and Raynaud's disease

The rationale of the treatment, I think, may be explained as follows The heat causes dilatation of the capillaries, and the surface is warm and red some time after being taken out of the bath This capillary dilatation naturally increases the circulation in the deeper parts, whether these be nerves or joints, as the pain is most probably caused by the pressure of the stasis or congestion, removal of these factors may reasonably be regarded as likely to relieve the pain That the circulation, both local and general, is improved is very evident, and patients have told me that the mere fact of treating chilblains on their hands has relieved the chilblains on their feet. In one case, in which the pulse-rate numbered 40 to 44 to the minute, it rose to 72 at the end of the treatment, and after four days' treatment was usually 72

In the treatment of chilblains, patients as a rule say that irritation ceases after the second treatment, and objectively the skin loses its tight, stretched character and presents a much more normal appearance. Moisture appears on the hands and remains for an hour or so after taking them out of the bath. After a course of treatment, the patient, in some cases, remains cured, and in others fresh chilblains appear in a period varying from a few days to six weeks, when further treatment results in a return to the normal again, but even if only a temporary normal can be obtained by this means, a temporary normal frequently produced will often result in a permanent normal

It may be asked, would not the same heat applied through a water bath have the same effect on the capillaries, and the circulation generally? The answer is that the same heat cannot be applied through water, since the highest temperature admissible in a water bath is 105° to 110° Fahr Paraffin wax, in the state

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CHILBLAINS

attacks, they may prevent a recurrence Occasionally a case is more prolonged in its course or more rebellious to treatment than usual, if the treatment by ultraviolet rays be combined with that by the wax bath, then the chilblains will clear up, however severe, persistent, or obstinate they may appear

The severity of the condition does not appear to affect the end-result Cases have varied from a condition of slight blotchy redness, with irritation, to those in which there have been deep, raw cracks and fissures in the front of the fingers and ulceration on the back of the hands Naturally the more severe the case, the longer is the return needed to attain a return to normal, but improvement should begin at once with treatment, and a period of two or three weeks will generally be found to be of sufficient length to be efficacious

of oil which it assumes when heated, is a much more feeble conductor of heat than water. Weber estimates the relative conductivities of oil and water as 0 003 and 0 001 respectively, in other words, water conducts three times as well as oil, or that oil is a much gentler heating agent, and therefore a higher temperature can be borne through it

It may be observed that so far these remarks have been confined to unbroken chilblains, though it is a matter of common knowledge that slight mechanical irritants produce bullous elevations of the epidermis over the nodules, or doughy swellings, and that those blister-like formations, filled with blood-stained serous fluid, are very apt to break down and form atonic ulcers which heal with difficulty and present the commonly called broken chilblain. Here the ultra-violet rays are most useful, and with their use the abraded surface readily heals. The daily application of a mild dose of the rays soon stimulates the sluggish ulcer and promotes healing, and then the cure proceeds as in the unbroken variety

A second degree plus or a third degree minus erythema should be produced with the lamp at a short distance—say, five to six inches. I have used all kinds of lamps with equally good effects—mercury-vapour, both air and water cooled, tungsten and carbon arc. The treatment should be repeated when the erythema has subsided. The good effect of the local treatment is greatly enhanced by the administration of the general body light bath twice weekly. The general circulation is stimulated, and the calcium content of the blood, which is usually deficient in these cases, is raised.

The results are surprisingly good, the irritation is rapidly soothed, desquamation frequently follows, and the fingers and toes resume their normal appearance The rays are not only of value in curing the lesion, but if used sufficiently early in those who have had previous

on the importance of realizing that the various pathological conditions in the mouth, for which light treatment is used, are as a rule only part of a general condition and that, therefore, general irradiation should be combined with local treatment. The wisdom of this will be taken for granted, and only the technique of the local treatment will be described here.

For intra-oral work, in the absence of the watercooled Kromayer lamp, a lamp is to be preferred of a size that can be easily manœuvred, so that the rays can be directed on to any desired spot in the mouth or pharynx Either two tungsten, one tungsten and one carbon, or the less expensive alloy electrodes can be used, and the lamp may have a quartz lens through which the rays can be focussed, and should in any case be furnished with some sort of conical applicator (e g a Ferguson's speculum) and a reflector A single exposure of three to four minutes at a distance of from six to twenty inches in a case of acute simple pharyngitis is often sufficient to abort an attack of what might otherwise become a severe generalized corvza treating the more septic type of pharyngitis and tonsillitis, gingivitis and pyorrhea, use may be made of the effect of ultra-violet light in producing electrodeposition of silver from a silver solution to be treated is dried, cleaned, and, if possible, packed off from the diluting effect of the saliva, and then painted or sprayed with a 1-5 per cent solution of silver nitrate It is then exposed for three to five minutes to ultra-violet light in the manner described above, until a staining effect is observed

The theoretical considerations underlying the use of silver nitrate and ultra-violet light in conjunction in this manner have already been described at length by the author, and the chief points in favour of using this method in the intra-oral conditions described are that it results in a fixation of toxins which would other-

The Treatment of Throat Conditions with Ultra-Violet Light and Silver Nitrate.

By L SHILLITO, MA, MB, BCh
Clinef Assistant, Electrotherapeutic Department, St Thomas's
Hospital

T this time of year, when pharyngitis is a complaint of fairly frequent occurrence, often resisting all efforts at treatment, it is worth considering the good results that may be obtained with ultra-violet light. There is a tendency at present to meet new claims for actinotherapy with scepticism, and while many practitioners have an ultra-violet lamp in their consulting room, not a few regard local applications to the pharynx, etc., as being rather within the sphere of the specialist. Indeed, it is only lately that the value of actinotherapy in ear, nose and throat work has been realized in this country, workers abroad having been ahead of us in this type of treatment.

Turning to recent literature on the subject, Cemach' has described his method of quartz light irradiation in inflammation of the tonsils, especially in cases of Plaut-Vincent angina. In obstinate pharyngitis, intensive quartz light irradiation has apparently answered very well. Eidinow, in an article on ultraviolet light in diseases of the nose and throat, describes his technique of general irradiation combined with local treatment by a water-cooled throat lamp emitting ultra-violet light of sufficient intensity to produce an erythema reaction after 60 seconds exposure of the mucous membrane. Talbot's also insists

Ear, Nose and Throat Emergencies in General Practice.

B1 SIDNEY BERNSTEIN, MRCS, LRCP Surgeon-in-charge, Ear, Nose and Throat Department, Royal Infirmary, Gloucester

In this article I propose to deal with the more common conditions of the ear, nose and throat likely to be met with in general practice, which require immediate attention either because of the serious complications which may ensue if treatment is delayed or on account of the intense pain and discomfort caused. I also intend to limit myself to those cases in which the early treatment lies within the scope of the general practitioner.

NOSE

Of the various affections of the nose falling within this category, epistaxis and acute nasal sinusitis are the most common

Epistaxis is in most cases relatively harmless and in some cases even beneficial, its severity increases with age, and in the aged may reach grave proportions, it is, however, alarming to the patient, who expects to have something done immediately. Epistaxis is merely a symptom and not a disease, it may be due to a large number of conditions, ranging from local causes, such as trauma, ulceration, and adenoids in children, to such general conditions as high blood-pressure, the severe anæmias, cardiac failure and the acute specific fevers. In some cases, such as high blood-pressure and cardiac failure, the bleeding may be beneficial and acts

wise be absorbed, and also the rapid dissociation of the silver solution brought about by the ultra-violet light sets free powerful oxidizing agents in intimate relation with the tissues Besides this, ultra-violet rays exert a sedative effect on nerve endings as the result possibly of some biochemical change at present incompletely understood, and this is a factor of particular advantage in treating such painful conditions as throat inflammations

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ordinary acute rhinitis or "cold in the head," although it may also occur as a result of the spread from infection in the neighbourhood, as when an acute maxillary sinusitis results from dental sepsis. The mucous membrane of the nasal sinuses is continuous with the nasal mucous membrane, with the result that an acute infection of the nose is liable to affect one or more of the sinuses as well. Any local nasal deformity, such as a deflected septum, increases the liability to sinus infection. Unless the drainage of the affected sinus be appreciably interfered with, the acute sinusitis may be masked by the accompanying nasal infection and may eventually pass into the chronic stage.

In the mild cases, there is a feeling of fullness in the head, with a dull ache in the affected sinus, which is made worse by stooping or bending down. In the more severe cases, where the drainage is occluded acute pain and severe constitutional symptoms develop. In frontal sinusitis, severe periodic supra-orbital pain is experienced, which is very characteristic, the pain usually commences in the morning, reaches a maximum about midday and has usually completely passed off by the evening, there will also be present tenderness on pressure over the sinus, accompanied in the more severe cases by headache and retro-orbital pain. Maxillary sinusitis is distinguished by tenderness on pressure over the sinus through the canine fossa, accompanied by pain in the region of the cheek on the affected side

Treatment in the early stages of acute sinusitis is non-operative, aiming at re-establishing free drainage of the sinus by reducing the swelling of the mucous membrane and thus preventing the occurrence of a chronic infection. The patient should be kept in bed in a warm, well-aired room, and a mercurial purge and saline should be administered in the early stages. A diaphoretic mixture may be given, while to relieve the pain and headache a powder containing aspirin, phen-

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as a safety valve In the great majority of the cases, the bleeding comes from Little's area on the anterior and lower part of the nasal septum Usually, the bleeding can be easily and rapidly stopped In the mild cases, a plug of wool wrung out in adrenaline solution is inserted into each nostril, and the alæ nasi squeezed together, cold being applied to the face and back of the neck, and the patient kept upright in a chair In the more severe cases, the nose is inspected with the aid of a good forehead light and mopped out with a tampon soaked in hydrogen peroxide, or it may even be necessary to resort to plugging the nose for a few minutes with ribbon gauze soaked in equal parts of 5 per cent cocaine solution and 1 1,000 adrenaline solution This will control the bleeding and enable the vessel at fault to be seen If the bleeding is from Little's area, the bleeding vessel should be cauterized, either by means of the electric cautery at dull-red heat or by means of pure carbolic acid applied by a probe, care being taken not to use an excess of the acid

Should the bleeding be coming from either the turbinate bones or the ethmoidal region, it will be necessary to pack the nose tightly with ribbon gauze soaked in hydrogen peroxide In packing the nose, a long-bladed nasal speculum should be inserted into the nose and the gauze packed tightly between the blades, which are then withdrawn This enables the nose to be packed efficiently, with a minimum of discomfort to the patient The packing should be removed at the end of 24 hours, because of the possibility of aural complications In all cases, it is an advantage to give an injection of morphia and a hæmostatic serum, and an ointment such as menthol gr x in vaseline 3i should be ordered to be applied inside the nose for a week after A search should always be made later for the cause of the epistaxis, and this should be corrected if possible

Acute sinusitis is usually an accompaniment of the

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the mastoid antrum has been opened, eventually to discover that the real trouble was a furuncle in the meatus. In cases of doubt it is wiser to consider the case at first as being one of the graver nature.

In furunculosis, there is usually a red, tender swelling in the meatus, rendering it difficult to insert a speculum into the meatus without causing excruciating pain, the drum, when seen, is normal. On careful palpation no bony tenderness can be elicited, although some tender glands may be palpable just in front of the tip of the mastoid process, while in the majority of cases movement of the auricle causes severe pain. Deafness is slight, and the hearing improves on cleaning out the meatus, when cedema is present, it tends to obliterate the post-auricular groove, while the pain is usually more intense than in either of the other two conditions, due to the unyielding nature of the tissues of the external meatus.

In acute middle-ear suppuration, there is a varying degree of redness of the drum, associated with pain, temperature and deafness. If pus is present in the middle-ear cleft, all landmarks of the drum will be obliterated, while the latter will be red and bulging

In acute mastoiditis, it is rare to find a case not showing some signs in the drum, while almost invariably the postero-superior meatal wall sags down into the lumen of the meatus. There is impairment of hearing, together with marked bony tenderness on pressure over the mastoid antrum, and this may be associated with redness, swelling and cedema of the tissues over the mastoid. The cedema in this case is posterior to, and in the early stages does not tend to obliterate, the post-auricular sulcus, in contradistinction to what occurs in a case of furunculosis, while no pain is experienced on moving the auricle. It is rare in these days to come across cases of large sub-periosteal abscesses, as acute mastoiditis is diagnosed and sent in for operation much

acetin and pyramidon given at intervals will be found helpful. As regards local treatment, a tampon soaked in equal parts of cocaine solution (5 per cent) and adrenaline placed under the middle turbinate bone will reduce the swelling around the sinus opening, this may be done several times during the course of the day. Frequent inhalations of menthol in boiling water should be prescribed as well. A hot-air bath to the head, carefully regulated, is of the utmost value in lessening the pain. Should the symptoms not subside within a couple of days, or should ædema make its appearance, the question of operative interference to drain the sinus would have to be considered. When the acute attack has subsided any nasal irregularity should be corrected.

Fractured nose—Where the nasal bones are fractured and there is any external deformity, it is essential that this be corrected immediately, before the onset of any ædema and swelling, which is liable to mask the amount of correction necessary. An attempt should also be made to correct any deformity of the septum, but this is not so important, as a submucous resection can be undertaken later to carry this out

Foreign bodies in the nose are frequently seen in children, who are brought to see the practitioner with a unilateral purulent nasal discharge. The temptation to seize the foreign body should be resisted, an anæsthetic administered, and a hook inserted behind the object, which is then removed from the nose. In some cases it may be found necessary to push the foreign body into the nasopharynx and remove it thus

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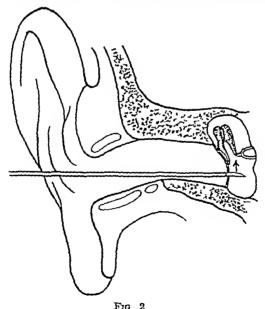
The aural conditions most frequently requiring immediate attention are furunculosis of the external meatus, acute middle-ear suppuration and acute mastoiditis. The differential diagnosis of these three conditions is frequently difficult, and I have known of cases where

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posterior half, and should be carried upwards and backwards behind the handle of the malleus, to stop short at Shrapnell's membrane Care must be taken not to plunge the knife too deeply through the drum for fear of dislocating the stapes or injuring the inner tympanic wall (Figs 1 and 2) The meatus should be



mopped out, and carbolic acid and glycerine drops should be instilled
The after-treatment consists in



keeping the meatus clean by daily syringing, after which it should be dried, and either glycerine and cai-

earlier than it used to be

Furunculosis -In the early stages of a meatal furuncle, the meatus should be thoroughly cleansed by syringing with warm boric lotion, throughly drying the meatus and inserting a plug of cotton-wool soaked in glycerine and carbolic acid (5 per cent) If the exact site of the furuncle can be discovered, it may be aborted by touching it with pure carbolic acid, this treatment should be carried out daily Should the condition not subside under treatment, and also in the more advanced cases, incision of the furuncle under general anæsthesia becomes necessary The meatus is cleansed by syringing with boracic lotion, dried and painted with tincture of iodine The incision should start internal to the furuncle and be carried outwards through it, being deepened through the perichondrium down to the cartilage to relieve the tension of the inflamed tissues, the furuncle should be curetted, painted with pure carbolic acid and packed with ribbon gauze soaked in spirit The packing should be changed daily, and the meatus kept clean by irrigation with saline or some other bland solution

Acute middle-ear suppuration —As regards the treatment of acute suppuration of the middle ear, there is at present a certain amount of difference of opinion as to when to incise the drum Personally, I feel that in every case where the pain is severe, or where the patient has been kept awake a single night by the pain, the drum should be immediately incised, irrespective of the physical signs. I am certain that by performing this small operation in all cases earlier than is at present often done a large number of mastoid operations would be avoided. The operation is a relatively simple one. The meatus is thoroughly cleansed and painted with iodine, with a good forehead light, under gas or ether anæsthesia, the drum is incised, the incision should commence at the lowest portion of the drum in its

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childhood, although it does occur occasionally in adults There are two varieties (1) the chronic form, which is usually due to tuberculous disease of the cervical vertebræ or cervical lymphatic glands, and is relatively uncommon, and (2) the acute variety, due to suppuration in the lymphatic glands lying between the prevertebral muscles and the pharynx, arising from some focus of infection in the oro-pharyngeal and naso-pharyngeal regions In a large number of cases, no complaint is offered by the child until the abscess has reached such a size as to cause difficulty both in inspiration and deglutition In others, especially adults and older children, there is a general feeling of malaise, associated with pain on moving the head, marked pyrexia, swelling of the neck, followed later by dysphagia, and eventually by dyspnœa

The diagnosis is obvious on looking into the mouth with the tongue well depressed, when a fluctuating swelling of the posterior pharyngeal wall to one side of the mid-line will be seen. This is distinguished from a quinsy by the fact that the tonsil is seen lying in front of the swelling. Care should be taken, when examining the child, to keep its head straight in the mid-line, so as to avoid undue prominence of the vertebræ

In acute cases, the abscess should be opened through the mouth, preferably without an anæsthetic Should the abscess be pointing it may be opened by means of a pair of sinus forceps, otherwise by means of a vertical incision made with a guarded knife, the child being immediately rolled on its side. Should an anæsthetic be administered, the child's head should be extended over the head of the table before making the incision, and the pus mopped out as rapidly as possible. The chronic variety of abscess should not be opened through the mouth, but by means of an incision along the posterior border of the sterno-mastoid muscle.

Peritonsillar abscess consists of a collection of pus in

bolic acid or spirit drops instilled

Acute mastorditis requires the operation of drainage of the mastoid antrum, together with the clearing out of all the cells in the mastoid process, whether obviously infected or not

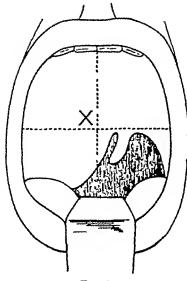
Chronic middle-ear suppuration—I should like to utter a word of warning regarding cases of chronic suppuration of the middle ear, owing to their liability to develop complications, which may be fatal patients who refuse operation to clear up this condition should be kept under regular observation, and the development of headache, giddiness, nystagmus or rigors should be regarded with grave suspicion, owing to the possibility of intracranial or labyrinthine infection

Foreign bodies in the external meatus usually do not require urgent removal, and more harm may be done by unskilful and hurried attempts to remove the foreign body than the latter would have caused The majority of foreign bodies can be removed by syringing, the stream of water being directed along the meatal wall past the object, which is washed out by the return stream Objects which have become firmly wedged by reason of their size or shape, or by becoming swollen through absorption of moisture, will not be removed by syringing A hook should in these cases be passed along the meatal wall behind the object, which can then be removed In a few cases this method will also fail, when surgical removal by means of an operation depending on the position of the foreign body in the meatus will have to be undertaken

The throat emergencies to be considered here include retropharyngeal abscess, peritonsillar abscess, and cases of laryngeal obstruction

Retropharyngeal abscess is essentially a disease of

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given, and hot fomentations applied to the neck Should the condition not clear up after incision, the possibility of its being a sarcoma of the tonsil must be considered. When the acute inflammation has subsided, enucleation of the tonsils should always be carried out

Laryngeal obstruction may be divided into two large groups those due to some organic cause, and those due to spasm of the glottis, which may be due to some local trouble or to some lesion elsewhere

Organic causes range from impacted foreign bodies and diphtheritic membrane in the larynx, neoplasms of the larynx, cedema of the larynx due to inflammation and sepsis in the immediate neighbourhood, to congenital abnormalities of the larynx interfering with respiration. In cases of severe respiratory obstruction, causing asphyxia, immediate tracheotomy is called for, after which, when the patient has recovered from the immediate effects of the operation, the cause of the obstruction can be dealt with. In children, no anæsthetic will be required, while in adults all that is needed

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the soft tissues surrounding the tonsil, external to the capsule, usually situated in the soft palate, having arisen as a result of an acute tonsillitis It occurs most frequently in adults The symptoms are typical of an acute tonsillitis, but much more severe There is marked pain in the region of the tonsil, radiating up to the ear The patient looks ill and anxious, is unable to open his mouth completely owing to spasm of the muscles, while there is marked dysphagia and usually pyrexia The mouth is full of mucus and saliva, owing to the pain on swallowing Both tonsils are usually red and inflamed, while that on the affected side is displaced towards the mid-line, the tissues of the soft palate are red and congested, with bulging over the site of the abscess, the uvula is cedematous and displaced to the opposite side Frequently there is present an abscess on both sides, one usually appearing a few days before the other

In the early stages the patient should be kept in bed, and a mercurial purge, followed by a saline, administered Aspirin or salicylate of sodium should be given internally. Locally, frequent gargles of hydrogen peroxide (10 vols) in hot water should be used, followed by syringing the mouth with a warm solution of sodium bicarbonate to remove the sticky secretion By the fourth day the abscess should be ready for incision, this should be done as soon as there is pus In some cases considerable relief is obtained, even in the absence of pus, by an incision into the congested tissues The site of incision should be over the abscess, if the latter is pointing, failing this, it should be just made above a line drawn across the base of the uvula and external to the line of the anterior pillar of the fauces (Fig 3) The mucous membrane is incised with a guarded knife, and then a pair of sinus forceps is inserted to a depth of half-an-inch and widely opened to evacuate the pus. Hot mouth washes should then be

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in cases of acute laryngitis, and also in rickety children, who usually show some exciting cause, such as enlarged tonsils and adenoids or gastro-intestinal disorder. Usually the attack occurs at night, the child wakes up with difficulty in breathing, particularly inspiration, there is inspiratory stridor, indrawing of the lower part of the chest and cyanosis. In some cases convulsions may occur, accompanied by evacuation of urine and fæces. Usually, after a few seconds, a long whistling inspiration occurs, the attack passes off, and the child falls asleep. Death is rare in these attacks.

The child should be placed in a hot bath and stimulated by slapping its chest. In the variety due to acute laryngitis, an emetic dose of vinum ipecacuanhæ will relieve the spasm. Any source of irritation should be removed, and the child given cod-liver oil and malt and bromides

Foreign bodies in the air passages —A foreign body in the respiratory tract will cause varying symptoms, depending on the size of the object and also its situation. A foreign body impacted at the upper aperture of the larynx requires immediate treatment, owing to the complete obstruction resulting. The mouth should be kept open by a gag, and the forefinger inserted into the pharynx and the object removed. Should this fail, immediate laryngotomy should be performed. A foreign body anywhere else in the respiratory passages is unlikely to cause complete obstruction to respiration, and should be handed over, as soon as possible, to someone skilled in the use of endoscopic instruments, for its removal, probangs and coin-catchers should never be employed.

Where the obstruction is due to ædema, which may spread, or laryngeal carcinoma, the tracheotomy should be performed as low as possible —

The patient should be placed on a hard table, with a sandbag under the shoulders and the neck fully extended. The patient's head and neck should be held by an assistant as straight as possible. The operator, standing on the patient's right, holds the trachea with the thumb and index finger to steady the larynx, and an incision is made in the mid-line from the cricoid cartilage down to the suprasternal notch. The incision is rapidly deepened to expose the tracheal rings, the isthmus of the thyroid gland being divided between ligatures. The infrahyoid muscles are retracted equally on both sides, so as not to displace the trachea. The cricoid cartilage is now grasped with the left hand and the knife, with the edge pointing towards the head, is inserted between two of the rings of the trachea. Two or three rings of the trachea are now divided, and the cut edges kept apart by introducing the points of a tracheal dilator, or, failing this, an ordinary pair of forceps. An oval may be cut from the opening to prevent any necrosis by pressure of the tube. The tube may then be introduced into the trachea and fastened in position.

Owing to the adductor group of muscles of the larynx being more powerful than the abductors, spasm of these muscles will result in complete laryngeal obstruction Spasm of the laryngeal muscles may be due to any form of irritation in the neighbourhood of the larynx, such as the inhalation of irritating vapours, it may arise from irritation of the recurrent laryngeal nerves along their course, it may be due to central nervous disease, or may be purely hysterical The spasm may be severe enough to cause unconsciousness. Usually the attacks are not fatal, except when due to some serious lesion, such as tabes or a mediastinal neoplasm In the milder forms, an emetic frequently relieves the spasm, while amyl nitrite inhalations also help to abort the attack In some cases it may be necessary to administer chloroform to allay the spasm The general hygiene of the patient should be attended to, any source of irritation being removed and alcohol and tobacco forbidden

Children are very prone to attacks of laryngeal spasm, and these nearly all occur at night It may occur

The Relative Value of Radium and of X-Ray Treatment of Malignant Disease

S Finzi discusses this important question and lays down the following directions Very radio-sensitive tumours, such as lymphosarcoma and rapidly growing neoplasms, even when the skull is involved, should always be treated with X-rays growths which tend to remain localized, such as rodent ulcer, small squamous-celled carcinomas of the skin and of the larynx, should always receive radium therapy Tumours with a high radio-resistance, if surgery and diathermy are not applicable, should preferably be treated by radium, but if the time factor is increased many of these cases can be satisfactorily dealt with by X-rays given daily or almost daily for six weeks In growths in the mouth, pharynx and upper respiratory passages, the best results are given either by X-rays alone or by a combination of X-rays and radium In some cases radium alone may be used, needles for the local growth and a radium collar for the neck. In growths of the cervix uten, radium should be applied locally and X-rays for the glandular areas In rectal carcinoma, radium is more successful than X-rays In mammary carcinoma, radium needles have proved most effective, but many cases are unsuitable. For mediastinal tumours, X-rays must be employed, but a radium plaque made up with wax may be combined - (British Journal of Radiology, 1930, vol m, 161)

The Treatment of Recurrent Carcinoma of the Breast

C C Anderson writes on the effects of treatment of recurrent carcinoma of the breast in a series of 46 patients and publishes notes of six typical cases He is of opinion that efficient radiation therapy can bring about a state of apparent cure in patients suffering from recurrent careinoma of the breast, and in the more advanced cases a high degree of palliation can be obtained Radium therapy would appear to be more efficient than X-ray therapy, probably as a result of the more profound effect of the faster gamma ray on the malignant cells Results published in the literature suggest that where a sufficient quantity of radium is available a higher percentage of apparent cure is obtained by removing the radium to a distance of 4 or even 6 cm, or by the interstitial application of large numbers of small, heavily screened radium needles Even better results will be obtained by the use of the radium bomb, employing quantities of one or more grammes of radium. The after-care of the patient is equally important Iron and arsenic should always be exhibited for considerable periods and ultra-violet radiation is a valuable adjuvant maintenance of the physical well-being of the patient should be regarded as a most important part of the treatment -(New Zealand Medical Journal, vol xxix, no 151, June, 1930, 134)

Practical Notes.

The Choice of Surgical or Radiological Treatment in Cancer

In the Mutter Lectures at the College of Physicians of Philadelphia, R B Greenough, taking as his title "The Surgeon and Cancer," touched on many points, among them the relative spheres of the surgeon and the radiologist in the treatment of While in favour of team-work between the surgeon, radiologist, pathologist, general physician and specialist, such as a laryngologist, neurologist or genito-urinary expert, he, perhaps naturally, considers that the general surgeon should play the The radical operation, which removes in one piece leading part the whole of the local disease, together with the structures first in line of extension, provides the most positive and certain method for permanent cure Mammary cancer is perhaps the best example, and, in this situation, removal of the whole breast, the pectoral muscles and deep fascia, together with the axillary contents, yields as high as 50 per cent "cures" on a five-year followup in early cases in which the axillary lymphatic glands are free from infection, and even 20 per cent in later and less favourable cases in which the disease has extended into the axilla Unfortunately, in other situations the anatomical conditions prevent such a complete radical operation as in the case of the breast, thus the so-called "radical" Wertheim operation for carcinoma of the cervix uten fails, and radium therapy is the method of choice for this condition A radical operation which fails to achieve complete removal is a mistake, and though a quarter of a century ago, when there was no other remedy available, forlorn-hope operations were perhaps justifiable, now, with radium treatment at hand, such operations are ill-advised Prc-cancerous lesions, such as the keratosis and papillomas in elderly people, are best treated by radium, but when doubt exists whether or not malignancy has supervened, especially in the lip or tongue, where metastatic growths are prone to follow, operation and pathological examination provide information which is most important for the further conduct of the case Generally speaking, the rapidly growing undifferentiated tumours are the most radio-sensitive, but there are many exceptions to this rule, and experience must qualify the histological predictions, rodent ulcers, embryomas of the testis, some parotid tumours, the lympho-epithelioma of Regaud and Ewing's endothelial myeloma are highly radio sensitive, whereas squamous-celled carcinoma and fibrosarcoma are very insensitive to irradiation Surgery and irradiation treatment supplement each other in several ways A most satisfactory surgical measure for the relief of pain is the injection of alcohol into the sensory nerves -(Transactions of the College of Physicians of Philadelphia, third series, vol 1, 245-258)

PRACTICAL NOTES

advantage to have such information presented in a more precise, didactic form -(Canadian Medical Association Journal, vol. xxii, בין בין בין בין היים אונים No 5, May 1930, 619) ultra-violet irradiation, alone or by each combined with antitoxin, there was a reduction of 40 per cent in the mortality rate as compared with the series treated by magnesium sulphate packs, and the temperature fell to normal two and a half to three days sooner in those treated by irradiation than in those treated by the older methods, the reduction of the duration of the disease being most marked under ultra-violet irradiation Similarly, ultra-violet irradiation combined with erysipelas toxin was rather more effective than X-rays combined with antitoxin, though both are very successful The advantages of ultra-violet irradiation are (1) that it is readily obtained everywhere and devoid of danger as contrasted with X-rays, (2) it requires one treatment only as a rule, though it may, if necessary, be repeated without risk, (8) that it

Cancer of the Lip, Tongue and Skin

About the middle of the last century the recorded mortalityrate from cancer was rather more than double that for males, but since then, as Sir George Newman points out in a prefatory note to Mrs Janet E Forber's (née Lane-Claypon) statistical report on the above forms of carcmoma, there has been a gradual diminution in the difference, with the result that about five years ago the rates became roughly equal, and recently the rate for males has slightly exceeded that for females Previous reports from the Ministry of Health have dealt chiefly with the organs mainly attacked by cancer in women, the present one is concerned with sites mainly affected in men-the lip and the tongue, with which, owing to certain technical similarities, it has been found to be convenient to consider also malignant disease of the skin report analyses recorded statistics from various sources, and thus provides a mass of interesting information. Cancer of the lip is about 12 times commoner in men than among women, and generally the available evidence does not incriminate the habit of smoking, though old clay pipes and other methods of smoking prone to cause burns or epithelial damage may, by chronic irritation, play a part It runs a slow course and thus contrasts with cancer of the tongue The lower lip is much more often attacked than the upper lip, the proportional incidence being 95 and 5 per cent respectively Operation, when the glands of one or both sides are removed at the same time as the growth, gives a survivalrate at 5 years after operation of about 62 per cent The available sample for all stages of the disease and for all methods of radiological treatment gives a survival-rate of 761 per cent at three years after treatment

Cancer of the tongue is roughly ten times commoner in men than in women, the mean age is approximately 54 years, rather less than in cancer of the lip (57 years), while the mean age at death for tongue cancer in this country is 61 years, or 9 years earlier than in cancer of the lip While there is a close association with leucoplakia, either with or without previous syphilis.

Treatment of Malignant Tumours by Radium in Sweden

Professor Gosta Forssell, of the Radiumhemmet, Stockholm, in the tenth Mackenzie Davidson Memorial Lecture, compares the percentages of five-year freedom from recurrence after radium treatment only and after operation only in five sites of carcinoma and in sarcoma In 207 cases of carcinoma of the skin (180 being operable without glandular metastases), success was attained by radium in 69 per cent, in 140 cases operated upon, 65 per cent In 66 cases of cancer of the labia treated by radium, the percentage of cures was 68, while among 241 cases operated upon, the percentage was 62 In carcinoma of the mouth, including the tongue, the radium cures were 18 per cent, and the surgical 81 per cent, in cancer of the cervix uteri, the corresponding percentages were 21 and 36, and in carcinoms of the body of the uterus, 435 and 428 The successes in sarcoma were less numerous than in carcinoma, but were regarded as greater than those obtained by operation Forssell has during the last decade increasingly combined surgical with radio-therapeutical methods, the former as a rule being carried out by electro-endotherapy, either with the electric knife or by electro-coagulation. Before operation, the tumour is reduced in size by irradiation as much as possible without any damage to the surrounding tissues, and the nearest glandular area is also irradiated During the operation, radium tubes are temporarily inserted, and after the operation the nearest glandular areas are irradiated with hard-filtered X-rays, or, better, with teleradium -(British Journal of Radiology, 1930, vol m. 198)

The Age Incidence of Carcinoma.

T R Waugh and T L Fisher publish some interesting conclusions regarding the age incidence of carcinoma. The more important of them are as follows (1) That from year to year cancer is not occurring on an average in younger individuals (2) That educa-tion of the public has not caused earlier hospitalization to a sufficient degree to appreciably alter average age figures cancer in the female occurs on an average about five years earlier (4) That while there are fewer cases of cancer than in the male in individuals over sixty, the probability of having the disease increases for those who live beyond that age and this probability very likely continues to increase as the years go on (5) That in Montreal there is, in hospital cases, a definite preponderance of cancer of the breast as compared with other organs the uterus cervical growths are principally pre-menopausal, endometrial growths, post-menopausal (7) That carcinoma arising from glandular epithelium tends to occur earlier in life than that from squamous epithelium, with two main exceptions, namely, the cervix and prostate, which derive their epithelium from mesoderm Many of these points brought out by these cases are common knowledge, based on chincal experience, but it may be of

PRACTICAL NOTES

advantage to have such information presented in a more precise, didactic form -(Canadian Medical Association Journal, vol. xxii, ALL CORNO DECRETOR DE LE AMPOS No 5, May 1930, 619 1 ultra-violet irradiation, alone or by each combined with antitoxin, there was a reduction of 40 per cent in the mortality rate as compared with the series treated by magnesium sulphate packs, and the temperature fell to normal two and a half to three days sooner in those treated by irradiation than in those treated by the older methods, the reduction of the duration of the disease being most marked under ultra-violet irradiation Similarly, ultra-violet irradiation combined with erysipelas toxin was rather more effective than X-rays combined with antitoxin, though both are very successful The advantages of ultra-violet irradiation are (1) that it is readily obtained everywhere and devoid of danger as contrasted with X-rays, (2) it requires one treatment only as a rule, though it may, if necessary, be repeated without risk, (3) that it is inexpensive, and (4) gives rather better results than any other form of treatment -(Journal of the American Medical Association, Chicago, 1930, vol xcv, 1-4)

The Treatment of Tetanus Neonatorum

A Bratusch-Marrain has found that magnesium sulphate combined with the injection of antitoxin is of greater value in saving life in cases of tetanus neonatorium than is antitoxin alone. In one series of 36 cases the mortality was reduced from 95 per cent to 50 per cent, whilst in another series of 10 cases treated by this method the mortality was 60 per cent as against 95 per cent when treated by antitoxin alone. The magnesium sulphate is injected in doses of 6 c cm of an 8 per cent solution up to seven times a day. It is usually only necessary to inject it five times daily, but in very severe cases it may be given seven times. The treatment must be continued until all convulsions have ceased—(Wiener klinische Wochenschrift, 1930, June 26, 810)

The Treatment of Migraine by a Ketogenic Diet

Barborks gives an account of fifty cases of inveterate migraine in patients who had undergone many kinds of treatment, including surgical measures, without benefit, and were desperate and willing to try any procedure, regardless of the effort involved. They were placed for many months on a diet low in carbohydrates and high in fats, which produces a ketosis. In fourteen cases the attacks were controlled, and diacetic acid, tested for daily, was always present in the urine in nine and intermittently in five, in 25 cases, in which improvement occurred, ketosis was maintained in two only, and in 23 was periodic, eleven patients were not benefited, but only two kept to the diet accurately so as to be in a state of ketosis. Many hypotheses have been put forward to explain migraine an alkalosis has been thought to develop forty-eight hours before an attack, many find that an excessive carbohydrate intake precipitates an attack, and in such cases a ketogenic diet

Treatment of Malignant Tumours by Radium in Sweden

Professor Gösta Forssell, of the Radiumhemmet, Stockholm, in the tenth Mackenzie Davidson Memorial Lecture, compares the percentages of five-year freedom from recurrence after radium treatment only and after operation only in five sites of carcinoma and in sarcoma In 207 cases of carcinoma of the skin (180 being operable without glandular metastases), success was attained by radium in 69 per cent, in 140 cases operated upon, 65 per cent were cured In 66 cases of cancer of the labia treated by radium, the percentage of cures was 68, while among 241 cases operated upon, the percentage was 62 In carcinoma of the mouth, including the tongue, the radium cures were 18 per cent, and the surgical 31 per cent, in cancer of the cervix uters, the corresponding per-organs, the penis, scrotum and vulva The death certificates for England and Wales studied by Brownlee and others show that cancer of the skin occurs more frequently among those having outdoor occupation of several kinds, but it is unlikely that, as Molesworth and Lawrence have argued for Australia, direct sunlight alone causes cutaneous cancer Workers exposed to extreme heat, such as puddlers, brickmakers and glasshouse workers, have a relatively higher death-rate from cancer of the skin vival-rate three years after operation is probably about 40 to 50 per cent, and of all cases treated radiologically much superior, 80 to 90 per cent There is perhaps a slightly greater incidence of cancer of the skin generally among men than among women Cancer of the scrotum among chimneysweeps is not common, but is of special interest as being, like mule-spinners' cancer, an occupational risk, no definite series of the cases appears to have been treated by radio-therapy Cancer of the penis is also rare, but is specially related to phimosis, which was present in 193 out of 271 patients, and is very seldom seen in Jews and in Mohammedans, thus contrasting with the incidence in Hindus Among 649 cases there were eleven under the age of twenty years and six The average age appears to be between 52 and cases over 80 54 years The mean average duration of the disease is longer than that of the tongue and uterus, but markedly less than that of other parts of the skin Although no large series of cases treated by irradiations has been published, it is considered probable that the results would be at least as favourable as with surgery In cancer of the vulva the results of surgical treatment are bad, at the Radiumhemmet, Stockholm, the most recent treatment is by electro-coagulation combined with radium-at-distance — (Ministry of Health Reports on Public Health and Medical Subjects, no 59, 1930)

Recent Methods of Treating Erysipelas

Ude and Platou have analysed 402 cases of erysipelas treated in the Minneapolis General Hospital by the various methods (a) mag-

Reviews of Books.

Some Aspects of the Cancer Problem Edited by W BLAIR BELL, M.D., FRCS, Director of the Liverpool Medical Research Organization and Professor of Gynæcology and Obstetrics, University of Liverpool London Bailhère, Tindall and Cox, 1930 11 by 7½ inches Pp xiv and 543 90 plates Price 63s

This finely produced and beautifully illustrated work is an account of researches into the nature and control of malignant disease, commenced in the University of Liverpool in 1905 and continued by the Liverpool Medical Research Organization (formerly the Liverpool Cancer Committee), and in addition contains some of the sixty-three papers on the subject published by members of the large staff of the Liverpool Medical Research Organization Dr Blair Bell sets ont the history of this extensive team-work in connection with the well-known treatment of malignant disease by colloidal lead, of which he has been the moving spirit Bound up with and necessarily underlying this treatment is the view taken of the nature of malignant disease Cancer is here regarded as a specific process, but not due to a single or specific cause original idea was that the chorionic epithelium was a normally malignant tissue, and that if it were possible to obtain some material like the hypothetical hormone elaborated by the fœtus which normally is responsible for inhibiting the myasive powers of the chorionic epithelium, this might be used for the treatment of cancer The similarities between the chorionic epithelium and malignant cells are described, and the conclusion is reached that while chorionic cpithelium is a normally malignant tissue which is subject to somatic control, malignant neoplasia is a reversion of the somatic cell to the early embryonic type forming the trophoblast Lead has long been known to influence growth and to produce abortion, and the latter effect was ascribed by the Liverpool workers to a selective action on the chorionic epithelium and not, as was generally believed, to hæmorrhage into the nterus The treatment of malignant disease by lead was begun in 1920, but no report was issued until fifty cases had been treated The first patient was treated for carcinoma of the breast by intravenous mjections of partlycolloidal lead iodide and was alive and well more than nine years later The various preparations of lead used are described, great attention is naturally paid to the toxic effects, and emphasis is laid on the dangers that may result from the use of unsatisfactory preparations or from slight variations in the technique. In fact, the adverse criticisms based on results obtained elsewhere are suggested to depend on failure to carry out treatment correctly A large number of cases treated are described in considerable detail, and a bibliography of 665 publications is appended

Radium and Cancer (Curietherapy) By Duncan C L Fitzwilliams, C M G, M D, Ch M, F R C S London H K Lewis and Co, 1930 Pp 172 8 plates (4 coloured) and 64 illustrations in the text Price 12s 6d

This book is written out of the personal experience of a surgeon who has been one of the pioneers of radium therapy in this

seems reasonable As this diet has a low protein content, it might also help cases thought to be due to excess of protein or to be hypersensitive to some one protein, further, as fat increases the discharge of bile into the intestine and duodenal peristalsis, benefit may result in cases ascribed to derangement of the liver and duodenum—(Proceedings of the Staff Meetings of the Mayo Clinic, 1930, vol v, 190)

Electrical Treatment in Cardiac Disease

A Schurg contributes a review of the various affections of the heart in which electrical treatment has been advocated and tried and of the various types of treatment which are used. Whereas in organic disease, such as valvular insufficiency or stenosis, it is obviously impossible for electrical treatment to affect any kind of curative measure, it is yet of some value in some types of organic disease of the myocardium. In functional conditions, and especially where there is some suspicion of weakness of the cardiac muscle, Dr. Schurig considers that electrical treatment of the right type is most valuable. This is the faradic current, applied over the cardiac area for the duration of from five to fifteen minutes at a time—(Medizinische Welt, 1930, June, 925)

Optic Atrophy after Hæmatemesis

In recording this sequence of events, F Terrien points out that Hippocrates mentioned it, and refers to Singer's collection of 194 cases of visual disturbances after hæmorrhage. Terson found that the most frequent interval between the hæmorrhages and the onset of symptoms was three to ten days. Although hæmatemesis most often causes blindness and optic atrophy, metrorrhagia may also do so. But traumatic hæmorrhage rarely is responsible, in the war it was very seldom reported, one estimate being 3 per cent. The prognosis is grave, for in 55 per cent of the cases blindness is permanent. Retinal ischæmia and anæmia are not the sole factors, but are the most essential, the additional one being some toxin such as may flood the circulation from failure of the protective function of the liver. On the appearance of visual disturbance measures should be taken to increase the cardiac activity and raise the blood pressure, and for these objects caffeine, massage, the prone position and transfusion are advisable—(Presse médical, Paris, 1930, July 10, 953-6)

REVIEWS OF BOOKS

creased incidence have not been supported by any convincing evidence. A striking feature in this well got-up work is the excellence of the numerous radiograms, and the chapter on the radiological aspects bears witness to the value of the work done by his colleague, Dr. Stanley Melville. Wisely critical, the author has an open mind, and in the section on treatment advocates a more frequent appeal to surgical exploration of the chest.

Peptic Ulcer Clinical Roentgenology, with Case Histories By JACOB BUCKSTEIN, M.D. Volume X of the Annals of Roentgenology's Series of Monographic Atlases. New York Paul B. Hoeber Inc., 1930. 8 inches by 10½ inches. Pp. xxiii and 337 287 figures. Price \$12

In this generously-illustrated work, Dr Jacob Buckstein, of Cornell University Medical College, draws on his ample material at the Alimentary Tract Division, Roentgen Department, Bellevue and Beth Israel Hospitals, New York, and deals with gastric, duodenal, gastro-jejunal and jejunal ulcers. In his first chapter he points out that, in 1898, H. P. Bowditch, of Boston, suggested investigation of the movements of the stomach by radiological methods, and that W B Cannon, of Harvard, first carried this into effect in the following year The illustrations show the macroscopical, histological and radiological appearances of the peptic ulcer, and the skiagrams are most conveniently faced by an abstract of the case from which they were taken. The three chapters dealing with gastric, duodenal, gastro-jejunal and jejunal ulcers first give a valuable review of the subject and the literature, and cover a wide field, thus the pathology of gastric ulcer in relation to its position, the anatomy of the bulbus duodeni, or cap of the stomach, as Cole called it to emphasize its close relationship to the stomach, and to differentiate it from the rest of the duodenum, are fully discussed, with references to the work of others on the subject. After these general remarks, skiagrams first of the normal stomach and duodenum and then of peptic ulcers are intro-Beautifully printed and illustrated, this atlas will be a most useful source of reference to all interested in gastro-duodenal pathology and radiological diagnosis

Taylor's Practice of Medicine Fourteenth edition By E POULTON, M D, F R C P, with the assistance of C PUTNAM SYMONDS, M D, F R C P, H W BARBER, M B, F R C P, and R D GILLESPIE, M D London J and A Churchill, 1930 Roy 8vo Pp xvi and 1,074 64 plates (12 coloured), 108 text-figures Price 25s

This popular textbook, now in its fortieth year, well maintains the reputation of the great school of Guy's Hospital, where it originated and continues to be edited from. It has undergone extensive revision, addition and subtraction, so that it is only a few pages more than that of the thirteenth edition in 1925. It contains more than double the number of plates, many of them

country, and should therefore be read by all who are interested in the subject. The technique of radium treatment is still in a state of transition, and five years hence may be as different as the technique of to-day differs from that of five years ago. Mr Fitzwilliams's book gives a very fair picture of the accepted methods of to-day, though it is naturally coloured by his personal preferences. We note, for example, that for malignant glands of the neck he carries out a block dissection rather than employing radium, and he does not mention any necessity for lead screens to protect the jaws or palate when using radium in the treatment of cancer of the tongue. Also, while treating cancer of the breast with radium, he clears out the axilla with the scalpel. Dr Malcolm Davidson contributes an excellent chapter on the treatment of cancer of the uterus. The book is well produced and illustrated

Cancer of the Larynx By Sir StClair Thomson, MD, FRCS, FRCP, and Lionel Colledge, MB, FRCS London Kegan Paul, Trench, Trubner and Co, 1980 Small demy 8vo Pp xxii and 244 112 illustrations Price 25s

This authoritative work, the outcome of much ripe experience and masterly surgical technique, is very generously illustrated with excellent figures of the clinical and pathological appearances, the details of the operative procedures, and the excellent portraits of six pioneers, including Felix Semon and Butlin, to whose work in the evolution of the laryngo-fissure a fine and most dutiful tribute is paid. The surgical treatment is very fully described, and the account of radiotherapy concludes with the opinion that malignant disease is at least as likely to reappear as after surgical removal, and therefore that until irradiation by radium or X-rays can show results as lasting as those which can be attained by surgery, it should be reserved for cases with indications which render them unsuitable for operation Diathermy, which is a useful palliative in lingual and oro-pharyngeal cancer, has not any place in the treatment of laryngeal carcinoma, and it is pointed out that partial removal of projecting pieces of growth do not give any relief and only opens up fresh channels of infection and This well-written monograph is a worthy outcome of British laryngology

Cancer of the Lung and other Intrathoracic Tumours By MAURICE DAVIDSON, M D, F R C P Bristol John Wright and Sons, Ltd., 1930 Pp x and 173 62 figs Price 17s 6d

The recent increase in the incidence of primary carcinoma of the lung has naturally given rise to much interest and a good deal of literature—statistical, pathological and clinical. Dr. Davidson has summarized the present state of knowledge on the subject and supplemented this by experience from the Brompton Hospital for Consumption and Diseases of the Chest. It appears that not only is the disease more frequent, but that the age incident is now lower than it was formerly. The suggestions that war gas, petrol fumes, dust and tar from the roads may play a part in the in-

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radiograms of the chest and teeth. A new section on mental diseases by Dr. R. D. Gillespie has been added, and the infectious tropical diseases have, with the assistance of Dr. Dyce Sharp, been collected together into a section following that of other infections, and followed by an account of diseases due to parasitic helminths. The account of skin diseases, for which Dr. H. W. Barber is responsible, has been considerably enlarged, and begins with accounts of streptococcal and staphylococcal infections. The full index is followed by an appendix on the test of renal function by means of the blood-urea clearance test. The editor must be congratulated on the success of his labours and on the up-to-date character of this valuable work.

A Textbook of Hygiene By J R CURRIS, MA, MD, DPH, Professor of Public Health, University of Glasgow Edinburgh E and S Livingstone, 1930 Pp xix and 844 110 illustrations Price 27s

Professor Currie, who has held the chair of preventive medicine at Queen's University, Kingston, Ontario, points out that the uniform ideal of the mere prevention of disease has been superseded by the more constructive policy of keying the individual's faculties up to their highest efficiency, and accordingly this comprehensive and, at the same time, concisely written textbook sets out the principles on which personal and communal efficiency are based. It is intended for medical students and candidates for the Diploma in Public Health and degrees in sanitary science. As has been hinted above, the subject matter is not confined to consideration of health and disease of the community, but deals with personal hygiene, and, further, it closely correlates public health in a welcome manner with the practice of medicine and with pathological science, as, for example, is shown in the chapters on immunity and specific infections. By combining the practical, philosophical and scientific aspects in authoritative work, which must be destined for many editions, Professor Currie has made the profession his debtor.

The Clinical Examination of the Nervous System By G H MONRAD-KROHN, M D, F R C P, with a Foreword by T GRAINGER STEWART, M D, F R C P Fifth edition London H K Lewis and Co, Ltd, 1930 Pp xvi and 222 57 illustrations Price 7s 6d

The latest edition of Professor Monrad-Krohn's excellent vade mecum for the budding neurologist contains an account of such recent methods of examination of the nervous system as ventriculography and encephalography, a section on the use of hypertonic saline solutions for reducing intracranial tension is also included, thus bringing the book right up to date. The portability of the book is a tribute to the style of the author, since a wealth of information is contained within a very small compass

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- ADAM, JAMES R., M B, Ch B Edin, DPH Edin and Glas, appointed Medical Officer of Health for the county of Roxburgh.
- AITKEN, J, MB, appointed Certifying Surgeon under the Factory and Workshop Acts for the Wainfleet District of the County of Lincoln
- BACH, FRANCIS, D M Oxf, appointed Medical Registrar to the British Red Cross Society & Clinic for Rheumatism, Peto-Place, London
- BERUMONT, J. H., M. B., Ch. B.(N. Z.), D. O. M. S., appointed Out patient Officer at the Royal London Ophthalmic Hospital, Moorfields
- BELL, ADC, BM, BCh Oxon, appointed Registrar to the Children's Department (Medical), St. Thomas s lios pital.
- BOGGON R H, MB, BB Lond., FRCB Eng, appointed First Assistant to the Surgical Unit, St Thomas's Hospital
- BROWNLIE, JAMES LAW, MD, ChB Glasg, DPH Camb (at present County Bacteriologist and Pathologist in Lanarkshire), appointed a Medical Officer of the Depart ment of Health for Scotland,
- BRUCE, C D, MB, ChB Edin, appointed Medical Officer of Perth Prison and Medical Superintendent of the Criminal Lunatic Dept. State Institution for Defectives
- COXON, H.C., M.B., appointed Certifying Surgeon under the Factory and Workshop Acts, for the Newburn District of the County of Northumberland.
- CREASER, F G, M B., B Ch Edin, appointed Certifying Surgeon under the Factor, and Workshop Acts for the Snath District of the County of York, W R
- DUGAN, ALEXANDER M., M.B., Ch.B. Aberd., D.P.H. Aberd., appointed Assistant Medical Officer of Health for School Medical Services in Aberdeen
- ETHERIDGE, C. E., M.B. Lond, L.R.C.P. Lond, M.R.C.S., appointed Medical Officer of Health, Whitstable
- GLOYER, R MON, L R C P, M R C S, appointed Resident House-Physician to The Westminster Hospital.
- GREGORY, J. C., M. R. C.S., L. R. C.P., appointed House Physician to Medical Unit University College Hospital, London.

- HARDIE, DAVID, M.C., M.A., M.B., Ch. B. Glas., F. R. C. B. Ed., D. O. Oxon., D. O. M. B. Lond., appointed Honorary Assistant Ophthalmic Surgeon, Cornelia and East Dorset Hospital, Poole
- HILL, H GARDINER MD Cantab., FR C.P Lond, appointed Physician in Charge of Out Patients to St. Thomas s Hospital.
- JACK, JAMES, MC, MB, Glasg., appointed Medical Officer of Health for the city of Durham
- HORIA, M, L.R.C.P., MR C.S., appointed Resident House-Surgeon to The Westminster Hospital
- MINDLINE J, LRCP, MRC.S., appointed Resident House-Surgeon to The Westminster Hospital
- ROBERTS, C. G., L. R. C. P., M. R. C. S., appointed Resident House-Physician to The Westminster Hospital.
- RUSSELL, BEDFORD, B Ch Camba F R C S appointed Surgeon in charge of the Throat Department of St. Bartholomew's Hospital.
- SHARP, C J. H., appointed Certifying Surgeon under the Factory and Workshop Acts for the Linslade District of the County of Buckingham
- STEPHENSON, H. M., appointed Certify ing Surgeon under the Factory and Workshop Acts for the Malden Newton District of the County of Dorset.
- STEWART, H. H., M.B., B.Chir Cantab., F.R.C.S. Eng., appointed Registrar to the Surgical Unit to St. Thomas s. Hospital.
- THOMAS, ALFRED TREVOR GWYN, MB., BS Durh., appointed one of the Surgeons on the Maurelania
- THOMSON, GL, MB, ChB Glass, appointed Certifying Surgeon under the Factory and Workshop Acts for the Tighnabruaich District of the County of Argyll.
- TOPHAM, E J E, MA, MB, B Chir., D M R E Cantab, appointed Radiologist, Wanganul Hospital, New Zealand
- TOPPING, ANDREW, MD Aberd, DPH, appointed Medical Officer of Health for Rochdale.
- WALKER, R N., M B., Ch B Glasg, DPH appointed Medical Officer of Health, Stirling
- WATSON, R., B Chir., Camb, LRC.P Lond., MRC.B DPH., appointed Assistant Medical Officer and Assistani School Medical Officer, Doncaster

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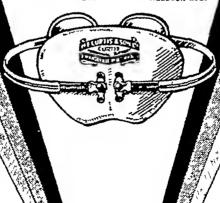
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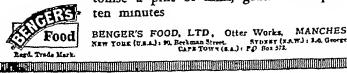
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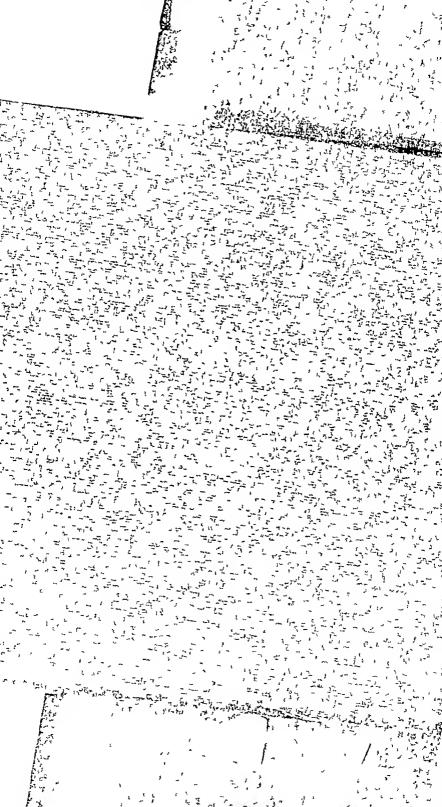
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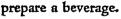
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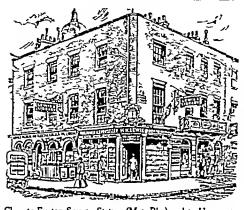
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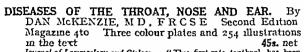
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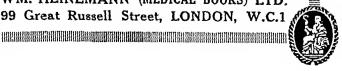
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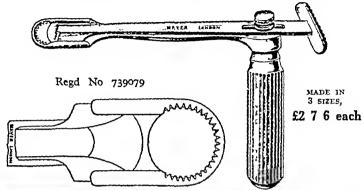
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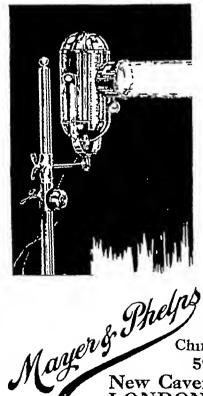
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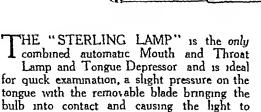
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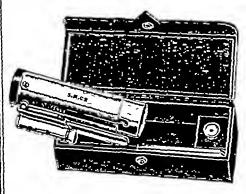


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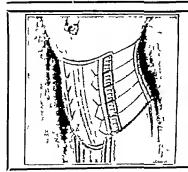
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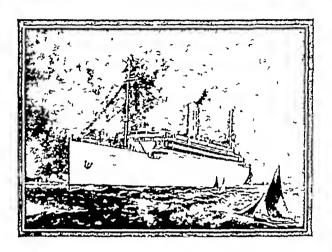


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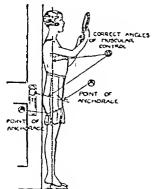
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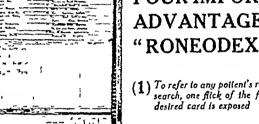
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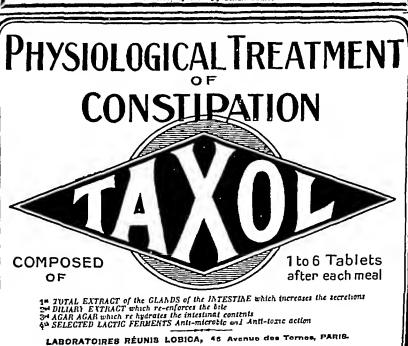
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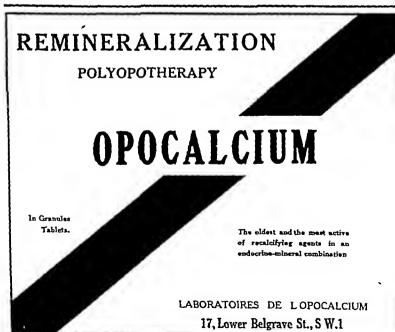
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GLYPHOCAL WITH STRYCHNINE.

Contains 110 grain of Strychnine in each fi drm

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Strikingly successful in the CONVALESCENCE after INFLUENZA.

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Nujol is of great assistance in the treatment of chronic irritable bowel. Unlike cathartics, whose action is stimulating to the muscles or irritating to the liming of the intestines, causing excessive secretion of mucous, Nujol acts merely as a gentle lubricant and solvent of impacted fecal matter. Though it absorbs intestinal toxins to a high degree, it cannot, itself, be absorbed. Consequently, toxemia is prevented, peristalsis is at a natural rate, and the stool is normal and properly formed.



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Intestinal Disinfection

PREVENTION OF CANCER

NE of the most noted authorities on Alimentary
Toxemia is firmly convinced of the importance of
this condition in the production of Cancer

The irritant effects of the stagnating contents of the bowel on the intestinal mucous membrane, accompanied as it often is with ulceration, is obviously a cause of Cancer in the bowel itself. According to this writer, the toxins absorbed produce atrophic changes in the breast and other organs which are specially prone to be followed by Cancer.

There are grounds, therefore, for hoping that the use of the most efficient of all intestinal disinfectants—Kerol—for prevention and cure of alimentary toxemia, will do much to prevent the occurrence of Cancer

For intestinal disinfection use KEROL CAPSULES (keratin-coated), they contain 3 m nims of Kerol One to three capsules may be given three or four times a day after meals

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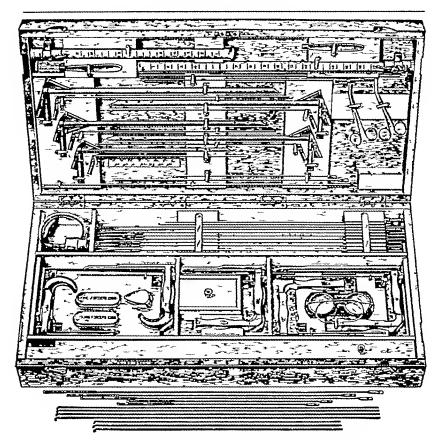
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is readily allayed by Antikamni i with Codeine Tablets and, with the laryngeal irritation relieved the distressing paroxysms ceas-

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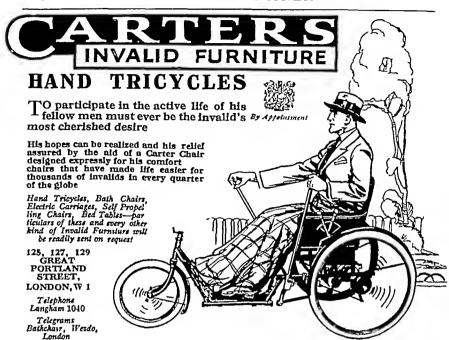
"Some little time ago you brought 'RYVITA' to my notice. I got a large number of my patients to take it regularly Some of these have been supplied in shops with 'something just as good.' Some are now huying an article which to my mind and experience is not as good as 'RYVITA.' There should not be this risk of their having something elte palmed off on the customers."

NOTE —The originals of all the above letters are of course, available, and can be seen by any persons properly interested

(We could fill many pages with similar letters from Medical Men)

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Dear Sirs,

I am in receipt of your sample of Kaylene for which I thank you. I do not dispense and do not wish to be without some in the house.

My last sample was used on a patient suffering from acute Ptomaine poisoning following a meal of shell fish (mussel) at 10.30 p.m. Symptoms first appeared at 12.30 a.m., and when I saw him at 3.0 a.m. he was vomiting blood and passing almost pure blood per rectum. He had commenced cramps and nervous twitchings which would shortly have gone on to tonic convulsions. He was very collapsed and had a weak pulse. I gave him ONLY Kaylene in cold water, one drachm every quarter of an hour from 3.0 until 8.0 a.m., when I felt it safe to leave him. For the next two days Kaylene was given every one to two hours and was then followed by Kaylene-ol. No other medication of any sort was used, and he made an excellent recovery. This follows a somewhat similar case which I treated at the end of last year.

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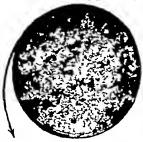
Telephone WELBECK 3553

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to a minutely subdivided flocculent curd as easily digested as human milk. Such is the action of Albulactin upon diluted cow's milk. It is universally agreed that next to breast feeding, the ideal food for an infant is one which approximates closely to the peculiar properties of the natural flind.

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These capsules have been prescribed for

INTERNAL TREATMENT OF GONORRHŒA, URETHRITIS AND OTHER AFFECTIONS OF THE GENITO-URINARY TRACT

for over 30 years with marked success, and as they are

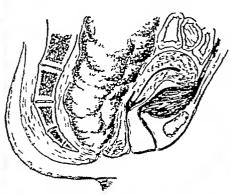
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always present, easily becomes serious in women. It causes interference with the pelvic circulation and tends to produce congestion of the uterus, not infrequently followed by functional disorders, producing dysmenor-thea, menorthagia, and even inflammatory conditions

AGAROL Brand Compound gives relief and frequently permanently restores the functional activity of the colon. One tablespoonful before retiring, gradually decreased as improvement takes place, is especially well adapted for the treatment of constipation in women, because of the gentle action of Agarol Brand Compound and absence of irritation from its use

A liberal trial quantity at the disposal of physicians

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Prepared by WILLIAM R. WARNER & CO, INC.
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Agarol Brand Compound is the original Mineral Oil—Agar Agar Emulsion (with Phenolphthalein)

and has these advantages
Perfect emulsification stability,
pleasant taste without artificial
flavouring free from sugar alkalies
and alcohol no oil leakage
no griping or pain no nausea
not habit forming

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- Vitad is the unsaponifiable fraction of Cod Liver Oil containing, in a high concentration, Vitamins A and D
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Two palatinoids respectively represent the full daily dose of Vitamins A and D

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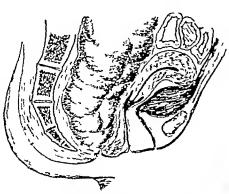
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The Menace of the Overloaded Bowel



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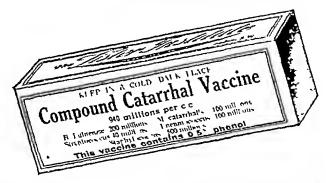
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CLINICAL INDICATION In vasomotor skin affections, chilblains, chilblain circulation, urticaria, in gross nutritional failure occurring in debility diseases, and also in delayed union of fracture, these Ampoules have proved of value



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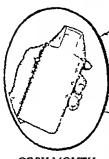




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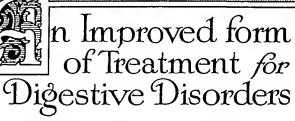
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'Petrolagar' Brand Paraffin Emulsion affords a valuable aid to diet and exercise in bringing about a restoration of normal bowel movement — the effect being purely mechanical.

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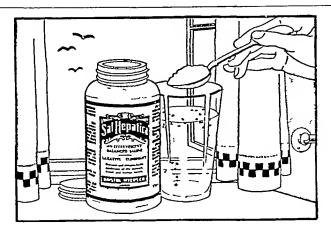
In many of the wasting diseases of childhood a sensitive, irritable stomach and intestines preclude proper nounshment the administration of Angier's Emulsion these organs become pacified and retentive, digestion is strengthened, and the assimilation of food is normal and complete We confidently urge its trial in marasmus, scrofulosis, inherited tuberculosis. anæmia, and in the malnutrition associated with acute infectious disease

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THE ORIGINAL AND STANDARD EMULSION OF PETROLEUM

Free Samples to the Medical Profession.

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Relieves congestion of the gall bladder.

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DIRECT ANTERO-POSTERIOR PRESSURE IS ESSENTIAL
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CURTIS ABDOMINAL SUPPORT MODEL NO I

No other Belt can serve this Purpose.





LONDON W 1

4th. October, 1929.

Mesers H E Curtis & Son, Ltd. Dear Sire.

I am enclosing bereaith two rediograms, taken althout and with a CURTIG ANDONIMAL SUPPORT, MCDEL No. 1. They sere taken conescutively in the erect posture at the same phase of respiration, i.e. with the obest empty, and the suscise of the addocsen neither voluntarily tightened nor relaxed The highest vertebra visible is the first lumbar The amblact was a thin girl with sunken esaphoid abdocen. (THE ANTERIOR SUPERIOR SPIRES PROJECTED & BETOMD THE ABDOMINAL WALL WHEN IN THE ERECT FOSITION)

The following affects due to the Support are clearly demonstrated:-

- (1) UPLIFT of the GREATER CURVATURE about as far as the thickness of one lumbar variebra
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This represents in ay amperience a very good result in fact for a straight absolutely unfated effect, it is as good as I have ever even.

Youre faithfully

BCh FRCP



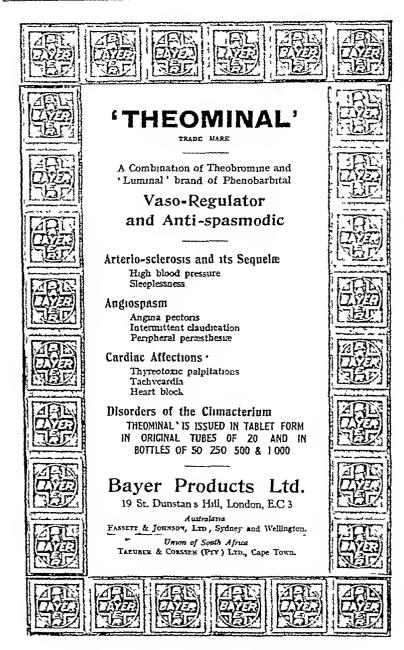
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It is particularly valuable as an addition to the diet of the expectant and nursing mother. For Horlick's is a perfectly balanced food containing fat, proteins, and soluble carbohydrates combined together in correct nutritive ratio. It is prepared from fresh, full-cream cows' milk, selected wheat and malted barley — and, during manufacture, is partially pre-digested to ensure easy assimilation.

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Taken during pregnancy, it builds up the mother and helps to maintain her vitality. A cupful taken regularly first thing in the morning frequently abolishes and almost invariably alleviates morning sickness.

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Horlick's is now obtainable in two forms—the original, natural-flavoured Malted Milk, and the new Chocolate Flavoured form—identical in its constituents with the original Horlick's, but flavoured with fine chocolate This new form is especially appreciated by children and by convalescents who welcome it as a delightful change from an ordinary milk diet. Both forms are equally nourishing Horlick's is sold in sealed glass bottles, price 2/-, 3/6, 8/6, 15/- Also in tablet form

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quickly respond to

SACCHAROMYCIN (B.O.C.)

(Prepared in France)

A yeast specially prepared in fluid form for ORAL administration and conveyed in sterilized ampoules of 2c c It activates at body temperature

It is rich in vitamins, especially vitamin B.

ACNE {

Clears up frequently after about 18 doses of Saccharomycan (BOC)

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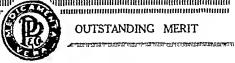
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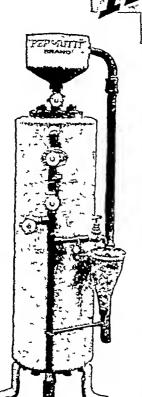
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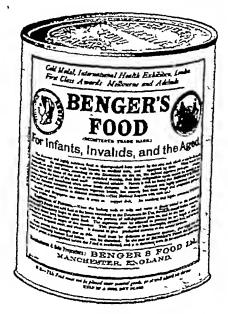
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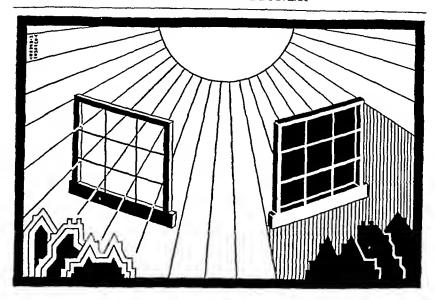
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JANUARY 1930

Foreword.

BY SIR STCLAIR THOMSON, M.D., FRCP, FRCS

Emeritus Professor of Laryngology, and Consulting Physician for Diseases of the Throat, King's College Hospital

"Look to thy mouth, diseases enter there" George Herbert (1593-1633)

Herbert, the Elizabethan poet, foretold the attention which medicine would give to mouth-breathing and oral sepsis three hundred years later. When Morgagni, two hundred years ago, laid down the principle, Ubi pus, ibi evacua, he was possibly only thinking of purulent collections on the surface of the body. It was left for our own generation to learn that pus must not only be "evacuated" from abscesses, but also from such cavities and areas as the middle ear, the mastoid, the para-nasal sinuses, the tonsils and the gums

It was an unqualified man at the end of last century who wrote a book with the arresting title "Shut your Mouth and Save your Life," and it was about the same date that the researches of Greville MacDonald on nasal respiration, and of William Hunter on oral sepsis, taught the profession and, through them, the public the physiological importance of the closed and clean mouth. The simple "incision

7

of Wilde" was the first step towards the surgery of the temporal bone, made possible—in common with all the astonishing developments of surgery—by the epoch-making work of Lister.

It is becoming a platitude to announce that we are living in the golden age of surgery. In the evolution of this brilliant period in the history of medicine, some of the discoveries—such as the incursions into the cianial, thoracic or abdominal cavities—may be more striking and dramatic, but it is a question if any have done more for the general health, well-being and happiness of the community than the enormous progress made in the department of otology and laryngology. The plain fact that the removal of tonsils and adenoids is acknowledged to be the most commonly performed of all operations, is enough to demonstrate the importance of our work connected with the throat and ear.

The reduction in the number of cases of chronic otorrhea, of enlarged glands, of adenoid facies, of stunted chests and of undersized and undeveloped adolescents—is evidence of the value to the community of the progress in this department. And not only is it mere material well-being which has been benefited. Smelling and tasting are two pleasures of existence which only the hypocritical smiff at. Speech and hearing are indissolubly linked together. The delights of both faculties makes music possible to "gild the dull realities of life." Unfortunately, the conservation of hearing renders us susceptible to the present-day curse of noise, though, without it, the death-roll of automobilism would be still heavier!

Apart from the three great departments of medicine, surgery and obstetrics, I think it will be agreed that there is no section of the healing art more important than that connected with the nose, throat and ear These areas guard the gateways of existence, and the

FOREWORD

watchful care of them is of primary importance. The contributions to this number, made by experienced leaders who have devoted their lives to studying the region, will demonstrate the great progress which has been, and is still, being made of diagnosing and treating affections of the ear and air passages

It is not so long ago, and yet the time seems distant, when diseases of the ear were cymically divided into "those which can be cured by syringing up them and those which cannot," and all pharyngeal and laryngeal affections were diagnosed by the single and simple aid of the handle of a teaspoon. Fortunately, as a speciality, oto-laryngology does not tend to detach itself from general practice, indeed, it tries to till fresh fields and then, so far as is possible, hand them over to the general commonwealth of practice Also it is, in itself, always dependent on wise cooperation with general medicine and those who practise it

Certain refinements of diagnosis and some delicacies of technique must remain in the hands of the few, but the following pages are not written to teach specialists, but to show the general practitioner what is being done, what an expert can do, and—perhaps most important of all—what he is justified in doing himself and when he must seek further aid. These thirteen communications are well worth the readers' careful consideration. They are written by the mæstri di loro che sanno. Another present-day platitude is that early diagnosis, in all things, is the pearl of great price. The opportunity for this must always rest with the family physician, and there is no need to remind him that.

"A little fire is quickly trodden out, Which being suffered, rivers cannot quench"

Radium in the Treatment of Malignant Disease of the Upper Air and Food Passages.

BY SIR WILLIAM MILLIGAN, MD

Consulting Aurist and Laryngologist to the Manchester Royal Infirmary, Surgeon Laryngologist to the Manchester Radium Institute

HE technique of radium therapy has undergone many changes during the past few years, mainly owing to the recognition of the fact that the periphery of a malignant growth, and not its central portions, is the area against which a ruthless attack should be made. For this reason the deep and central implantation of tubes has been largely superseded by their symmetrical arrangement around the outskirts of the growth with aid obtained as the result of recent developments in the surgery of access. The more thorough the access to any given growth, the more likely are the chances of destroying it

In certain situations the exposure of a growth is naturally more readily and more thoroughly effected than in others, and this fact unquestionably influences the prognosis. Much ingenuity has been displayed in devising a technique by means of which it may be possible to establish effective barrage around a growth, even when deeply seated. Experience has, moreover, shown that better results are obtained by long exposures with small doses of radium element, or radon in tubes, needles or seeds, rather than by short exposures and large doses.

The microscopic characteristics of the particular

growth also throw some light upon the chances of the successful destruction of its constituent cells: the less keratinization present, the more the response to radiation

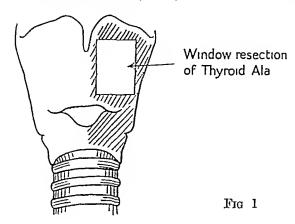
CARCINOMA OF THE LARYNX

During recent years great advances have been made in the treatment of localized intrinsic carcinoma by means of radium, so much so that there is good reason to expect that in certain types of cases in the near future irradiation from without will supplant laryngo-fissure and removal of a vocal cord from within, with its subsequent disadvantages, so far as the speaking voice is concerned The rapid disappearance of a localized pedunculated or papillomatous epithelioma of the vocal cord after radiation is quite remarkable, and although sufficient time has not elapsed to dogmatize upon the permanence of this method of treatment, cases are on record in which no signs of recurrence have been noted after an interval of many years Whether infiltrating growths with much impaired mobility of the cord will respond equally satisfactorily is still to be decided

The work more especially of Harmer in this country has shown the advantage of approaching the diseased area after a preliminary resection of a portion of the thyroid ala overlying the growth whether on the vocal cord itself or on the lateral laryngeal wall. After resecting sufficient of the ala to ensure ample access to the underlying growth, great care should be taken to preserve the perichondrium intact. A rim of the thyroid ala should be left to maintain a skeleton framework (Fig. 1) and to serve as a bridge under which needles containing radium may be slipped and retained in position

Cleminson, on the other hand, advocates entire removal of the ala to avoid what is unquestionably a

serious and not infrequent complication of radium therapy in this situation, viz, necrosis of cartilage, a

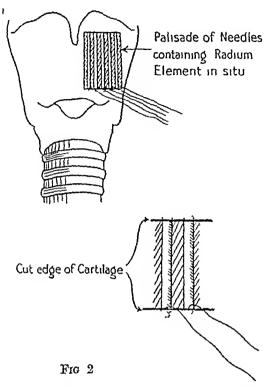


complication which should gradually become less frequent as correct dosage and correct time exposure are better understood

From five to six needles each containing 1 milligramme of radium sulphate and screened with 0 3 to 0 6 millimetres of platinum are arranged in pallisade form over the exposed perichondrium and gently insinuated under the ledge of alar cartilage bounding the window with their eyelets pointing downwards The attached silk threads are collected 2) together and drawn out through a dependent corner of the skin wound, after which the flap is replaced and sewn up The question of the necessity or otherwise of a tracheotomy is still sub judice. In the majority of my own cases I have performed one at the completion of the original operation, but in other cases I have not, and with no bad result As, however, the amount and extent of intralaryngeal ædema following radio-activity is an unknown factor, most operators prefer to err on the safe side and to open the trachea

The pahsade should be left in situ for six or seven days, the superficial wound then reopened and the tubes extracted by pulling gently on the silk threads

RADIUM TREATMENT



A certain amount of suppuration is always present, but rapidly ceases Should necrosis of cartilage ensue, however, prolonged delay in healing may be expected. The changes which take place in the contour of the growth may be watched from day to day by laryngeal examination and consist in loss of vascularity and shrinking of its substance In successful cases the functional results are excellent owing to the retained mobility of the vocal cord contrasting favourably with the gruff and often toneless voice following its excision This method of attack may be said to have superseded the former method of introducing a median radiumcontaining cylinder into the larynx By means of a laryngo-fissure, extensive intrinsic growths may be treated by the insertion of radon seeds screened with gold or platinum should a complete laryngectomy be

ruled out

The problems presented by extrinsic carcinoma of the larynx, by which is meant carcinoma of the interarytenoid commissure, the aryepiglottic folds, the sinus pyriformis, the epiglottis or those growths which invade the larynx from adjacent mucosa, are of an entirely different category and more difficult of solution Access by splitting the thyroid and cricoid cartilages in the middle line is to be avoided, ending as it practically invariably does, in suppuration and septic pneumonia Exposure of the growth from the outside by means of an incision along the anterior boider of the sterno-mastoid, although at times affording good view of the diseased area, is frequently disappoint-By means of suspension laryngoscopy, or with the aid of a directoscope, the affected area may be clearly seen and needles or seeds inserted around its periphery In such cases a tracheotomy is not always necessary In all implantations the needles should be placed, so far as is possible, parallel to one another and not more than 2 cm apart

BUCCAL AND PHARYNGEAL CARCINOMATA (EXCLUDING THE TONGUE)

In the treatment of buccal and pharyngeal caremomata, epidermoid epithelioma, the two main essentials for success are elimination of buccal sepsis and careful screening of bone. All diseased teeth should be removed, if not every tooth, and frequent antiseptic mouth washes used. When healing has taken place a denture made of lead at least 1 mm in thickness should be constructed and of sufficient size to protect the bone within the radius of effective radiations. A barrage of needles should then be introduced around the growth from within the mouth, or if the growth be situated on the inner aspect of the cheek, picferably from without, so as to minimize the risks of

RADIUM TREATMENT

sepsis Should the growth occur in the mucosa covering the hard palate, surface applications by means of needles attached to a dental plate will be found more suitable. The nearer the growth is to the anterior commissure of the lips, the more accessible it is and the more satisfactory the treatment.

In the region of the tonsil the needles may be introduced crosswise, half of the number pointing backwards, half forwards, or access may be obtained to the peritonsillar region after a subperiosteal resection of the ascending ramus and angle of the lower jaw, the whole area being subsequently subjected to distance irradiation by the application of a Columbia paste collar (15 mm thick) with the requisite number of needles attached to it

In buccal and pharyngeal malignancy, the exuberant and warty type of growth will be found to react to radium treatment more successfully than the ulcerating growth with hard and callous edges, and in a general way rapidly growing tumours respond more readily than those of slow formation. A feature of buccal carcinoma is the early and extensive implication of the lymphatic field due not to any inherent peculiarity in the structure of the primary growth, but rather to the mobility of the parts implicated and the superadded sepsis

The introduction of unscreened glass seeds into these growths is followed by a certain amount of necrosis of tissue and severe pain, because the β rays are not cut off, hence the advisability, whenever possible, of introducing radon seeds screened with 0 3 mm to 0 5 mm platinum or gold (Failla) cases Adequate screening is a matter of great importance if burns are to be avoided. The tendency to-day is to screen too little rather than too much. Screens of 1 mm platinum will in many situations be found advisable. Whether the cancer cell is entirely

ruled out

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8

RADIUM TREATMENT

method, so that whenever possible the introduction of needles through the nasal passages in or around the growth is preferable.

CESOPHAGEAL CARCINOMA.

The present position with regard to the treatment of esophageal carcinomata is, from whatever angle it may be viewed, admittedly most disappointing. True as it is that relief to symptoms may be given for a time, the discouraging fact remains that the mortality from the disease remains at practically 100 per cent. Several factors contribute to this deplorable circumstance—the late stage at which the great majority of cases present themselves for treatment, the high degree of malignancy of the growth, the consequent want of vitality of the patient, the maccessibility of the growth and its known resistance to irradiation, and above all, the frequency with which secondary deposits are found, not only in glands adjacent to the esophagus, but also in those at a distance from it

The problem of securing anything approaching to perfect access to the growth is still unsolved. With the esophagoscope the upper margins of a growth may be clearly defined, and by means of an X-ray picture the limits of its downward extension may be clearly visible, but owing to the constricted lumen and danger of rupturing the already diseased walls, only a small portion is accessible for treatment at any rate at one time. During the past few years I have employed a method of burying seeds (and latterly platinum screened radon seeds) around the periphery of the growth as seen through the esophagus. This procedure has been practised by many others, with varying degrees of temporary success. Even under the most favourable circumstances, the method is open to many objections owing to the technical

destroyed by a lethal dose or by the stimulation of a defensive mechanism on the part of the irradiated tissues is still a moot point. In the case of large growths a short course of pre-operative irradiation has the advantage of devitalizing the cancer cell and preventing dissemination, while post-operative irradiation destroys wandering cells.

NASAL AND NASOPHARYNGEAL CARCINOMATA AND SARCOMATA.

Access to malignant tumours in the nose, growths which vary much in their degree of malignancy, is as a rule easily obtained, either by means of the intranasal route or after the performance of a lateral rhinotomy, opening of the maxillary antrum (Caldwell-Luc), fronto-ethmoidal region, etc The introduction of needles or seeds is frequently followed by a certain amount of necrosis, which, however, owing to the more cancellous nature of the bony framework, is not so troublesome or so painful as that occurring in the dense bone of the lower jaw after irradiation In the case of large growths, it is advisable to remove as much as possible by ordinary surgical measures or by means of diathermy, and to irradiate what remains with a radium pack Most sarcomata rapidly disappear after suitable radiation, but, as there is a distinct tendency to recurrence, a sharp outlook should be kept for several months

In the treatment of naso-pharyngeal sarcomata, access to the growth may be had along the nasal passages, by way of the nasopharynx or by a combination of both routes. In the case of infiltrating carcinomata, an accurate cast of the nasopharynx in stent should be taken and the requisite number of needles firmly fixed to it, after which it is pulled up into position by strong silk threads passed through the nose Considerable discomfort attaches to this

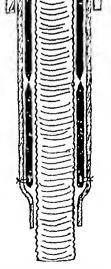
RADIUM TREATMENT

along which it is introduced and by means of which it is steaded Rigidity is thus obtained, and as the tube can be turned in any direction it is possible to implant the seeds with precision and regularity. No apprehension need be entertained as to the fate of the imprisoned seeds. Either they become encysted or pass into the lumen of the œsophagus to be subsequently got rid of per vias naturales

The method of introducing a single median platinum cylinder containing the charge of radium fixed to a copper wire or piece of whalebone—a method formerly much in vogue—has now been almost entirely discarded: first, because it lies in contact with only the oldest, most necrotic and septic part of the growth; and secondly, because it has been found impossible to

keep it accurately in situ owing to the movable nature of the parts implicated Moreover, forcible dilatation of the constricted lumen should never be practised on account of the risk of rupturing the often friable œsophageal wall Wright of Bristol has recently suggested the fixing of the necessary number of radium needles to the sides of a suitably sized Souttar's tube and passing the combined apparatus through the stricture after preliminary dilatation (Fig 4)

The formation of an œsophagealtracheal fistula is, considering that about 80 per cent of the growths occur at or about the bifurcation of Fig 4—A J Wright's the trachea, by no means an un-radium to an esophacommon complication, due either to aid of a collarless
active ulceration between adherent the permission of the
parts, to trauma, or to overdosage Journal of Laryngology)



difficulties of arranging the seeds in homogeneous pattern, of being certain that they do not perforate the walls of the esophagus during implantation, and of securing their retention in tissues movable and often necrotic and friable. Only the upper portions of a growth can be treated at one sitting. Should fibrosis result with opening up of the constricted lumen, a deeper portion is attacked at a later sitting and so on until it is possible to pass a fair-sized bougie into the stomach

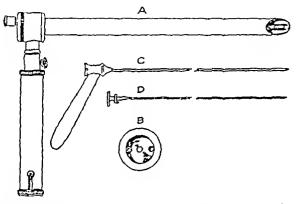


Fig. 3—A—Operating bronchoscope for the introduction of radium seeds. The tube revolves so that the seeds may be introduced in various positions. The bronchoscope is fitted with two very small tubes, one at the top and one at the bottom extending along the whole length of the bronchoscope, the top one carrying a small electric bulb and the bottom one the channel through which the radium introducing instrument is passed. The instrument is fitted with a special lamp stem and lamp, and a movable handle on which is mounted the revolving bronchoscope. The handle also carries the battery and is provided with a rheostat switch.

B—Shows a section of the bronchoscope tube C—The radium introducing instrument with its stillette, D

The method adopted is to insert the seeds with the aid of a specially constructed trocar (Fig. 3) in parallel series and 2 cm apart. Accurate implantation with the plunger is by no means a simple matter, and this, in my experience, is largely due to the difficulty of manipulating the long and non-rigid propeller at such a distance from the eye. To overcome this difficulty and to prevent the trocar "wobbling" I have had a special cosophageal tube with a by-pass constructed

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so far as I am aware a successful result has yet to be recorded.

Limited access to the growth may be had by means of a lateral incision in the neck and tilting the larynx over on its side and needles or seeds introduced. Splitting the thyroid and cricoid cartilages in the middle line and submucous resection of the cricoid plate is a method of approach which has been suggested and practised. When improved means of access to esophageal and post-cricoidal carcinomata are designed, treatment by irradiation will have a better chance of success.

THE GLANDULAR FIELD

When glands are enlarged and operable, a block dissection of the corresponding triangle of the neck should be made, followed by surface irradiation or implantation of needles In cases in which a growth crosses the middle line, it is necessary to perform a block dissection upon both sides of the neck When glands are enlarged, fixed, and moperable, surface applications afford the best, although poor, prospects of success Where no glands are palpable on clinical examination it is still advisable to perform a block dissection and to remove all which can be found with, in addition, the surrounding areolar That glandular deposits do not react to irradiation as satisfactorily as the primary growth is probably incorrect. In certain situations, eg the neck, owing to the presence of such radio-sensitive and movable structures as the larynx and the esophagus, it is not practicable to give such powerful irradiations as in some other regions of the body these circumstances, a dose which may be lethal to the primary focus is insufficient for the secondary deposits Hence the necessity of surgical intervention and external curretherapy

with radium.

Of late, attempts have been made to expose the growth by means of a thoracotomy—an operation, however, not devoid of danger. Even when efficiently performed, it is difficult in most cases and impossible in others actually to see the esophageal growth. It may, however, at times be palpated and needles inserted; but blind insertion of needles is on general principles to be deprecated. Although at the moment the surgery of access to the thoracic esophagus is in its infancy, a time will no doubt come when an improved technique will make the operation not only safe, but the only method of successfully attacking deep-seated esophageal carcinoma by means of radium therapy.

In my opinion the endoscopic introduction of radon seeds, however carefully done, and however much relief it may give for a time, is only a makeshift treatment and one which will almost certainly be abandoned in the near future. Time is the essence of the case the moment an esophageal carcinoma is discovered, and unless the whole growth can be irradiated (or removed) at one sitting, the chances are greatly against the patient. Difficulties were, however, made to be overcome, and praiseworthy efforts are being undertaken to improve technique and to devise an improved surgery of access

POST-CRICOID REGION

In post-cricoidal carcinoma, a disease mainly met with in women, treatment—whether operative or by means of irradiation or by a combination of both methods—is distinctly disappointing. The introduction of platinum radon seeds by endoscopy is open to precisely the same objections as in the case of esophageal carcinoma—the upper limits of the growth are visible, the deeper portions are not Hence irradiation can only be done piecemeal and

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definite expectation that it will cure the disease.

From this time onwards the question received more and more attention, particularly in Paris and New York, but it was not until 1913 that researches in radium therapy were commenced at St Bartholomew's Hospital At first it was employed only for inoperable cases which were treated by large doses of radium applied externally or buried in the centre of the growth Although some successful results were obtained, most of the early results were disappointing; radium burns were produced; the wounds often became septic and healed very slowly, if at all, and necrosis and sloughing of deeper tissues, of cartilages or of bones often supervened, and in some instances severe secondary hæmorrhages occurred With smaller doses and better technique our results have steadily improved different types of new growth have been treated We have received useful suggestions from many of our confrères abroad, and have derived great benefit from numerous visits to radium institutes, especially to that in Paris under Professor Regaud and that in Brussels under Professor Bayet

Dose and Filtration -The dangers of over-dosage have already been referred to above After sixteen vears' experience we have gradually come to the conclusion that it is safer to use small amounts of radium for longer periods. In most instances we have buried it instead of applying it externally in the form of a collar or To obtain a uniform irradiation of all the bomb affected tissues, platinum-iridium needles with wall thickness of 0.5 mm to 1 mm, and containing 1 or more mg of radium salt have been inserted into the tissues close to and around the growth rather than into it, taking care that the needles are also placed well beyond the obvious limits of the growth When burying needles the greatest care has been taken to prevent sepsis The duration of the treatment must depend

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Radium Treatment of Intrinsic Carcinoma of the Larynx.

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and
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N 1909 Sir Frederick Treves stated in a lecture at the London Hospital "With regard to epithelioma of the tongue and of the hp, they are cured by You say, of what degrees? I acknowledge that the cases are in the early stages of epithelioma; but they are epitheliomata that are ulcerating and that, as far as we know, can yield to no other treatment except that of operation" This statement startled the medical profession Shortly afterwards Sir Henry Buthn wrote a short account of his experience "on this very weighty question" in the Lancet of November, 1909 As he said "Radium, a year ago, was in quite an experimental stage in the treatment of epithelioma It is so still, for I only know of one undoubted case of epithelioma which has been cured by it in this country. And the reported cures in Paris still lack detail and confirmation, particularly with regard to the extent and depth of the disease" He summed up his article by saying that treatment by radium appears to be admirably adapted to ulcers of small and moderate extent, that the application is painless or painless, that there seems to be very little danger to life or health, but he warned the profession that patients ought not merely to be treated with radium in the hope that it may "do some good," but with the

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at present no evidence to show that one grade was more sensitive than another. In fact most types appear to be strongly radio-sensitive

For a long time it was very difficult to determine the best method of applying ray treatment and whether it should be radium or X-rays. About six years ago we discovered, on a visit to Brussels, that Dr Ledoux,* working in Professor Bayet's Clinic, had devised a method by which, after fenestrating the thyroid cartilage, he was able to insert radium needles into the growth with excellent results

Shortly afterwards a patient, aged 45, who was in the prime of life consulted us and was found to have an extensive growth involving the right side of the larynx, the anterior commissure and the front of the arytenoid cartilage, the greater part of the glottis was occluded The patient was seen in consultation with Sir StClair Thomson and told that the disease could only be treated by complete laryngectomy or by radium needles. He was warned that radium treatment was still in its infancy and that we had no previous experience whether it would succeed in his case. After careful consideration he refused to have a laryngectomy performed and decided to try the radium treatment. Six months later he was again seen by Sir StClair Thomson, who remarked "If we can see him this time next year without a recurrence it will be a splendid case". Now, five and a half years after this operation, he has a perfectly normal larynx with freely movable cords and a good voice

The result obtained in this case was so good that we devised an operation which closely resembles that shown us by Dr Ledoux, the main difference being that the needles are placed outside and not into the growth

Method Employed -A skin incision is made over the thyroid cartilage on the affected side starting at the centre of the hyoid bone and extending outwards and downwards along the posterior border of the thyroid cartilage. Or a "collar" incision may be made transversely across the middle of the thyroid cartilage The latter is perhaps preferable, especially if both

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^{*} L Ledoux "Traitement Curie Chirurgical du Cancer Laryngé" Le Cancer, 1924, page 100 19

on the size of the tumour, the distance between the needles and the thickness of the filters

Response to Treatment -It has been found that certain types of growth are more susceptible to radium than others. Thus, the rapidly growing epitheliomas sarcomas and the endotheliomas are all extremely radio-sensitive and can be treated with radium better than by surgery As a rule, the primary growth is easy to cure, but if metastases are present they are more difficult to attack, and the prognosis is bad Moreover, the response to radium varies greatly in the different regions of the body Thus, cancer of the anterior part of the tongue is easier to cure than a similar growth situated posteriorly Again, cancers of the tonsil, the pharynx and the jaws can only rarely be cured the esophagus the mortality of cancer is still nearly one hundred per cent In many of these situations malignant growths can only be treated successfully by a combination of radium, X-rays and diathermy.

The prognosis in any case of cancer depends on early diagnosis, the type of growth, the situation of the disease, the presence of metastases and the condition of the patient. Patients who are chronic alcoholics, who have lived in the tropics, or who are seriously debilitated rarely have a good resistance to malignant disease.

Intrinsic carcinoma of the larynx is perhaps one of the most favourable types of cancer in the whole body for radium treatment. In its early stages it is an entirely local disease. The glands are never affected. As a rule the patients are sound in health and have a good expectation of life. With the assistance of our colleagues we have now treated 29 cases of laryngeal carcinomata by radium. In 25 of them the diagnosis was confirmed by microscopical sections. Although the types varied slightly in their malignancy and considerably in the amount of keratinization, there is

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is inactive

Each needle has attached to it a piece of linen thread soaked in a solution of flavine 1 in 1,000 This material seems to cause less irritation than silk or others that have been tried. The threads are all tied together and buried beneath the muscles sutures are inserted into the skin, half of them being tied at once to close the wound completely and the other half left so that they can be tied later after the radium has been removed No dramage is employed and the skin incision is completely sealed with a collodion If the growth has extended across the middle line, a second window is made in the thyroid cartilage on the opposite side and needles are buried there also When necessary a low tracheotomy is then performed This is deliberately made the last stage of the operation to prevent infection of the laryngeal wound Tracheotomy was performed in all our earlier cases because it was feared that the reaction following the radium might cause so much swelling that the glottis would become obstructed In six of these cases the patients could not have breathed satisfactorily without tracheotomy But recently it has been discovered that it is not always necessary. If the glottis is fairly patent and one or both vocal cords are movable, the patient can usually tolerate the radium without a tracheotomy tube and the wound is not so likely to become infected.

In practice it has been found that when the patient can take a general anæsthetic without much difficulty in breathing it is rarely necessary to insert a tube into the trachea. When in any doubt, it is advisable to cut down and expose the front of the trachea without opening it. Catgut sutures are introduced as shown in the diagram and each suture is drawn to the opposite side of the neck and fastened to the skin with collodion so as to close the wound completely. If an attack of

sides of the larynx require treatment. The infrahyoid muscles are exposed and split longitudinally. The lateral aspect of the thyroid cartilage is exposed, the perichondrium covering it is divided and stripped backwards and forwards. The greater part of the cartilage is then resected. Thus a large window is made in the thyroid cartilage, but a framework is left consisting of the four margins. By this means the outer surface of the growth covered by the perichondrium is exposed. It is important not to destroy this capsule or to cut into the growth. The cartilage is removed for two reasons—to allow the needles to be placed as close to the growth as possible and to prevent the perichondritis or necrosis which may be caused by

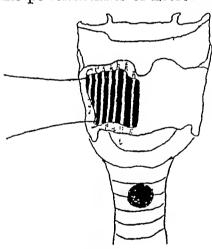


Fig 1 —Diagram showing needles in larynx.

From five to needles radiiim are then inserted, lying parallel to one another and vertical To keep them in position the ends of the needles are tucked under the framework of the cartılage. Care is taken that the needles do not penetrate into the growth or into the larvnx. At the lower

the radium.

end of the wound, if the growth is subglottic, the needles are pushed inside the cricoid ring, but in this situation the tissues are often so thin that unless great care is taken the needles may perforate the air passage. To obtain uniform irradiation the active part of the needles must extend well beyond the limits of the growth. Only the central part of a needle contains radium and about 6 mm, at each end

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none of the patients has been seriously ill

The time of the removal of the needles depends to some extent on the amount of reaction and inflammation in the wound. In one case the suppuration was so severe that the needles had to be removed earlier than was intended. In such an instance the skin wound requires drainage for several weeks. After removal of the needles the wound should be thoroughly irrigated with hydrogen peroxide or flavine, and unless pus is found it should be closed completely. If there is much effusion a small drainage tube may be retained for a few days. Some swelling and induration of the neck results from this treatment and may persist for a month or two. Ultimately the wounds heal soundly with soft movable scars.

Changes in the growth itself occur rapidly and even in ten days the lesion may appear less nodular Often the surface is then coated with a layer of white fibrin, the surrounding parts are generally ædematous and in some instances the swelling may occlude the glottis. Later, the inflammation subsides and after six weeks all signs of growth may have disappeared, leaving the cords symmetrical and equally movable. About this period the tracheotomy tube can usually be removed.

Dosage and Filtration —We have throughout used a 0 5 mm filter of platinum containing a small percentage of iridium. The applicators have been mostly 3 15 cm needles (active length 2 cm) and 2 15 cm needles (active length 1 cm), containing respectively 1 or 0 5 mg of radium element. In some cases these needles have contained 0 9 and 0 45 mg. On the average eight needles, seven long and one short, are used if one side only is being treated and about twelve for both sides. With about 7 mg. of radium element in the wound we usually leave the needles in situ for six or seven days. In some cases about 30 per cent.

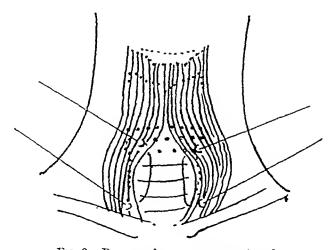


Fig 2 -Diagram showing exposure of traches

dyspnæa supervenes the sutures are pulled to their right side, thus retracting the muscles and exposing the trachea, which can then be opened in a moment

The needles are left in situ for periods of from four and a half to eight days according to the dose of radium employed and to the extent of the growth that has to be treated At the end of the treatment the wound has been found always infected when tracheotomy has been performed, but rarely otherwise. In some of them there was definite pus, while in others the exudation was serous, blood-stained or fibrinous The best wounds have been seen in those patients who did not require tracheotomies—proof that tracheotomy greatly increases the danger of sepsis Slight rises of temperature (99° to 101°) were common, but in only one case was the wound septic enough to cause anxiety. Cough has been a prominent feature of all the cases while the radium was in situ and a good deal of sticky mucus has been secreted in the larynx and trachea. Only in the very advanced case has the inflammation extended downwards and caused bronchitis With one exception no shock has resulted from the treatment There has been practically no pain or discomfort, and

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of them on the other were found to have slipped and the wound had to be reopened so that they could be



Fig 4 -Skiagram showing needles that have slipped

replaced. As far as is known this accident has only occurred once

The real danger that is to be feared is faulty dosage. It cannot be too strongly emphasized that in unskilled hands radium is a dangerous treatment. There is evidence to suggest that too small a dose may actually stimulate the growth. Too large a dose may also be disastrous. Already we have seen two patients, treated elsewhere, in whom extensive perichondritis supervened and nothing could be found to relieve the suppuration and pain which persisted for the rest of their days. Sepsis in any form is greatly to be feared as it is well known that radium wounds heal badly. In this situation, the cartilages are very liable to be infected and to necrose. Fistulæ may form, and even if the wound eventually heals the affected part becomes

heavily filtered X-rays has been given during two or three days immediately preceding the operation.

Difficulties and Dangers—As the result of these researches we have learnt that the treatment is surrounded with difficulties and dangers, so much so that no surgeon can safely undertake it without the assistance of an expert radiologist. It is hardly necessary to refer to the dangers that may be incurred by surgeons and nurses by careless handling of radium comparable to those of X-rays. The operation of introducing radium needles is comparatively simple, certainly easier than the ordinary surgical procedures. But care must be taken to ensure that all the needles are firmly fixed, otherwise there is a danger of their slipping out of place. If possible, an X-ray photograph should be made soon after the operation to prove that



Fig. 3 -Skiagram showing needles in correct position

all the needles are in position In one of our patients, when this was done, all the needles on one side and two

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free from pain and believing that they were cured, half of them for over two years

Thus, one patient, a medical man, had an extensive growth on the right side of his larynx involving the anterior commissure. To cure the condition a complete laryngectomy would have been necessary, but the operation was refused and fourteen radium needles were buried in the two sides of the larynx. All signs of the disease in the larynx disappeared rapidly. In two months the larynx had a healthy appearance, both cords moved freely and the voice was absolutely normal. Twelve months later he suddenly became hoarse again and a hard swelling was discovered in the position of the tracheotomy wound. It was explored and found to be a malignant growth surrounding the trachea, and inoperable. His health rapidly failed in spite of external radium treatment and he died twenty months after his operation from a recurrence in the neck, the larynx having remained healthy throughout

A second patient had a very extensive carcinoma involving the whole of one side of the larynx. Suspicious glands could be felt in the same side of the neck. Previously he had been treated for twelve months by continued small doses of X-rays. Eight radium needles were buried and all traces of the growth entirely disappeared, leaving a healthy larynx. The glands were removed later and found to be infected with carcinoma. His larynx, voice and general health remained normal for over three years, but eventually the growth recurred and he died four years after the

original operation

Cases 14

A third patient had an extensive growth involving the whole length of the left vocal cord, the anterior commissure, the base of the epiglottis slightly and the subglottic region. He was seen by Sir StClair Thomson, who agreed that the growth was too advanced for laryngo-fissure and that the patient was not strong enough for laryngectomy because he had an enlarged liver and had suffered from hæmatemesis. Radium needles were buried

Advanced Cases

20	Opera tion	Surg^on	Alive after	Dead after	Larynx.	1 otre	Cause of Death.
1 2 3	1924	Harmer "		L years 2 years	Normal Stenosis Normal	Good Husky Normal	Bronchitis Recurrence in
5	1925		=	2 veris 4 years	Stenosis Normal	Yormal Yormal	Debility Becurrence in larynx
0 7 8	1627 	"	2 years	l year l year 	No impro Normal No impro	Normal	Debility Hæmestemesis Died under
10 11 12 13 14	1928 1929 "	Rozo - Harmer - ", Cade , Cade		3 months 5 months ————————————————————————————————————	No impro Growth a Early im		anasthetic Paralysis [agitans

Fig 5 -Table I Advanced cases

fibrous and stenosis of the glottis supervenes In two of our early cases and in four of the advanced cases the patients had to wear tracheotomy tubes permanently

On the other hand, if radium is applied properly the treatment is comparatively harmless, and the patient suffers little if any discomfort

Results —A statement on "The Radium Problem" has recently been issued by the Radium Commission and the true position has been well summarized in the Times of November 15th last, as follows. "The attack on the primary growth is the easiest part of the task, but does not affect the development of secondary metastases. It proves that treatment of cancer, if it is to be successful, whether it is surgical excision, cautery, radium or X-rays, must be undertaken early. It is difficult to assess the relative value of radium in comparison with surgery"

During the past six years we have treated 29 cases by radium, 26 males and 3 females, with ages ranging from 45 to 67. At first patients were selected who had advanced growths which could only have been treated by complete laryngectomies. The results were so promising that we began to advise radium for early cases that could have been treated by laryngo-fissure. They can be grouped roughly into two classes.—

(1) Advanced cases in which the lesions were so extensive that they could only have been treated by laryngectomies. Some of these patients were in such a poor state of health as to be quite unfit for severe operations. There were 14 cases in this group. Only one has remained free from disease for more than five years. His vocal cords are freely movable and have a normal appearance. And only three other recently treated patients are alive. But the results have not been so bad as would appear at first sight because most of the ten that have died received temporary relief and were able to carry on their work.

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and the vocal cords have recovered so completely that they are freely movable and in some of them it is almost impossible to detect on which side the growths were situated. The voice results are far superior to those that can be obtained by cutting operations, the worst voices being better than the average obtained

Νo	Opera tion	Surgeon		Alive after	Dead after	Larynx	Voice	Cause of Death.
1 3 4 5 6 7 8 9 10 ** 11 12 13 14 16	1025 ". 1928 1927 1028 ". 1929	Harmer , Rose - Harmer , 1 ares - Mollison Tobotson Harmer Gado - Harmer		4 years 4 years 4 years 4 years 2 years 2 years 11 years 16 months 6 months 4 months	8 months 10 days 9 months 9 months	Kormal " Improved Normal Early imp	Strong Normal Hoarse Normal " Hoarse Normal rovement	Influenza Aiter second tracheotomy Recurrence
Cases 15				11	4			

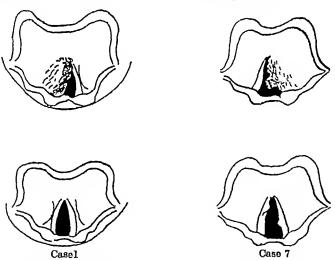
Fig 7 —Table 2 Early cases

by thyrotomy Only four patients have died In one of them the growth diminished in size but a stenosis of the glottis resulted and the patient died suddenly eight months later of heart failure; a second, a delicate old lady who had suffered also from permicious anæmia, succumbed after ten days to influenza contracted from her nurse, the third developed a stenosis of the glottis necessitating a tracheotomy and died after nine months, and the fourth died after ten months of debility after a very temporary improvement

Conclusions — These results are encouraging, but obviously it is too early at present to be certain to what extent the cures are permanent. It is possible that radium will be found to be the best treatment in all cases of intrinsic carcinoma of the larynx, but it must be remembered that very good results have been obtained in the past by surgery. Undoubtedly, as Butlin has said, this is "a very weighty question."

under a local anæsthetic The growth rapidly shrank and had entirely disappeared in three months The cord became freely movable although the edge was slightly swollen by ædematous fringes This patient died suddenly after a severe attack of hæmatemesis

Such results are encouraging, so much so that we believe that radium should always be advised rather than laryngectomy. If the disease is not completely eradicated within three months, even if any induration remains and if the patient is well enough, laryngectomy should be performed. Even in inoperable cases it seems probable that with careful selection some relief of symptoms and prolongation of life may be obtained with radium. And the voice results are infinitely superior to those that follow laryngectomies



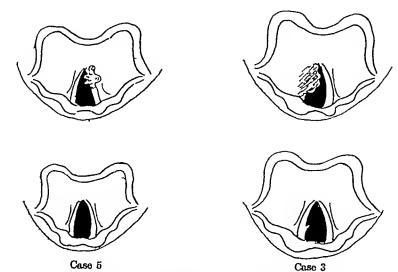
Figs 6 and 6a —Appearance of larging before and after treatment

(2) Early cases in which the growths were strictly confined to one vocal cord and did not involve either the anterior commissure or the arytenoid cartilage, namely, cases that could have been treated by laryngo-fissures. In this group there are 15 cases of whom 11 are living for periods up to four years, and in only two of them is there any suspicion of a recurrence. In many of them the growths have entirely disappeared

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always be tried before laryngectomy. If the disease is not completely eradicated within three months or if any induration remains it is probably safer to advise laryngectomy rather than to repeat the radium treatment. The amount of radium used for this treatment is so small that there is no contraindication to the performance of laryngectomy. Even in inoperable cases it seems probable that some relief of symptoms and some prolongation of life may be obtained by radium. If on exploring the larynx the growth is found to be infiltrating the cartilages extensively or to have perforated into the muscles surrounding the larynx, radium needles should not be inserted as such cases can be better treated by external irradiations such as X-rays, radium collars or bombs

In considering the relative ments of radium and surgery it must be emphasized that many patients even prefer to take the increased risk to life rather than lose their voices permanently. As far as our evidence goes, radium treatment if properly applied does not increase the risk



Figs 8 and 8a - Appearance of larynx before and after treatment

We have frequently been asked whether it is wise to recommend radium when it is known that there is a reasonable chance of curing the patient by operation Naturally the patient prefers radium when informed that it may cure him without mutilation, but this does not diminish the surgeon's responsibility. If it can be proved that radium can produce as high a percentage of cures as surgery it will give after results which are far superior to those that have been obtained by operations. The vocal cord may recover to such an extent that it is hardly possible to detect on which side the growth was situated. It may also become freely movable and the voice may be completely restored. In such instances the larynx does not appear to be weakened in any way

Having studied the results obtained by the two methods and having fully realized the responsibilities of deciding between them we have come to the conclusion that radium is the best treatment for all cases. In early cases the percentage of cures would appear to be quite as high as with surgery. In advanced cases there seems to be no doubt that radium should

modifications of this were devised, but a great advance was made when Gluck and others shut off the food passage from the airway completely after the removal of the larynx The opening in the pharynx was closed and the end of the trachea was attached to the skin. Thus, with proper care afterwards, the secretions and discharges from the pharynx were prevented from infecting the traches and lungs, even though sloughing might occur in the wound itself It must be remembered that a slough forms on the surface of any wound which has been contaminated by saliva, and therefore to keep aseptic a wound which has a large communication with the pharynx presents a special problem to the operator Whatever particular form the operation may take the following general precautions are the guides to safety

Blood during the operation and discharges of serum, pus or mucus after the operation must be prevented from reaching the trachea, and in order to obtain healing of the wound with the least amount of sloughing, all raw surfaces must be covered with flaps of skin or mucous membrane to protect them from the septic pharyngeal mucus. Only thus can bronchopneumonia, wound infection, and secondary hæmorrhage be avoided

Other factors which have led to better results are the selection of suitable cases and earlier diagnosis. It is therefore necessary to consider the pathological anatomy of cancer in the larynx and in the closely surrounding portions of the pharynx

It is just fifty years since Krishaber classified laryngeal cancer into intrinsic and extrinsic, the latter being really pharyngeal. Growths on the vocal cords and ventricular bands or in the ventricles and interarytenoid region were defined as intrinsic. Actually the great majority of these growths begin on the true vocal cords, and a few only in the ventricle or on the

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Operative Treatment of Cancer of the Larynx.

By LIONEL COLLEDGE, M.B., FRCS

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ILLROTH laid the foundation for the surgical treatment of laryngeal cancer in 1873 by a total excision of the larynx, and was followed in 1875 by Langenbeck, in whose clinic a plan for surmounting the technical difficulties had originally been evolved. The patients survived the operation, but the results were poor Bottini, however, performed total laryngectomy for a mixed-celled sarcoma in 1875 on a man aged twenty-four, who was known to be well and working in the fields more than three years later Less radical operations had up to this period met with very little success, and the only hope of obtaming lasting results lay in the direction of extensive removal. Nevertheless progress was slow, because even if the patients survived the immediate effect of the operation, many succumbed, during what should have been the period of convalescence, to erysipelas, sloughing, secondary hæmorrhage, septicæmia, mediastinitis, and (most fatal of all septic complications) to bronchopneumonia A smooth recovery scarcely ever occurred, and m most of those who had the strength and good fortune to pass through these dangers, the disease rapidly recurred so that hardly any survived at the end of a year after the operation

To protect the patients against these dangers preliminary tracheotomy was performed two or three weeks beforehand, and the opening in the pharynx left wide open after the laryngectomy Various

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cases of the epiglottis, invades the cervical lymphatic glands at an early stage. This difference between the intralaryngeal and the pharyngeal groups must always have foremost consideration in designing an operation to suit a particular case. The early laryngectomies were directed agamst tumours of all these types, both laryngeal and pharyngeal, which partly explains the large numbers of indifferent end-results. removal of the larynx would suffice even for an advanced intralaryngeal growth and probably result m cure, whereas for a growth in the pharyngeal group a portion of the pharynx and possibly of the tongue together with the lymphatic glands on one or even both sides of the neck would be necessary, nor even so would the outlook be so favourable In recent years the best results have been obtained by reserving laryngectomy for advanced intrinsic cases, and this gives a high percentage of cures. Mackenty of New York, for example, reserves the operation entirely for intrinsic cancer He states that fifty-eight laryngectomies for mtrinsic cancer between 1922 and 1926 show five recurrences. Tapia of Madrid found thirty-two recurrences in seventy-five cases treated by laryngectomy between 1908 and 1919, but in twenty-four of these thirty-two cases, the tumour was extrinsic with enlarged cervical glands and in only eight cases of recurrence was it intrinsic

Trotter has shown that in many intrinsic cases, especially in the epilaryngeal group of tumours, an adequate exposure can be obtained by lateral pharyngotomy. The obstacles encountered in approaching the lateral wall of the pharynx are the ala of the thyroid cartilage, which overlaps the pyriform fossa, and the great cornu of the hyoid bone. If these are cut away after turning the prelaryngeal muscles off the front of the larynx on one side, the lateral wall of the pharynx is freely exposed and can be laid open from

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ventricular bands. They have the characteristic that they remain long confined to the cavity of the larynx and rarely infect the cervical glands until they have spread into the pharynx. There is also a subdivision of the intralaryngeal group of tumours, subglottic cancer, which Isambert described. StClair Thomson has redirected attention to this group of tumours, which had escaped notice in spite of Isambert, because it is of special importance. The subglottic tumours present special difficulty in diagnosis and treatment, and they show greater liability to recurrence after local excision than do tumours situated on the cords.

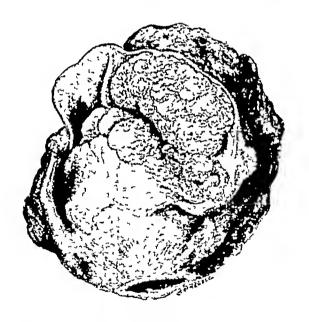


Fig 1 -EXTRINSIC CANOER OF THE LARYNX

The extrinsic group of Krishaber includes tumours of the epiglottis and aryepiglottic folds, which have been classified by Trotter as epilaryngeal tumours, and tumours in the pyriform sinus and in the post-criceid region, which are pharyngeal tumours. Carcinoma in all these four situations, with the exception in some

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lymphatic glands.

Early diagnosis is essential if such conservative operations on the pharynx are to have a fair chance of success. It also renders possible conservative treatment of intralaryngeal tumours. In 1883 Buthin wrote "The disease is evidently far too deeply seated to admit of removal by so slight an operation" (thyrotomy); and in 1886 Semon wrote "Thyrotomy with subsequent extirpation through the wound, yields very bad results in malignant growths, and should not be attempted" Nevertheless in later years after further experience, when patients presented themselves at an earlier stage of the disease,

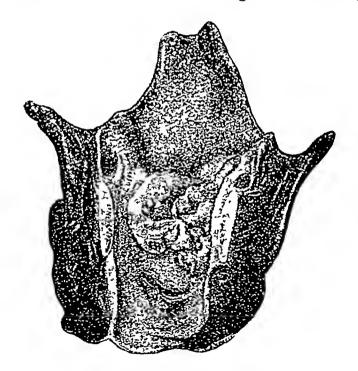


Fig 2.—Intensic Cancer of the Larynx.

they quite altered their views. Eventually Semon was able to report a series of twenty-four cases of

end to end It is necessary to divide the superior laryngeal nerve and vessels which cross the field. This gives a free exposure of the entrance to the larynx, and a tumour of the epiglottis or aryepiglottic fold can be excised with a margin of half to three-quarters of an inch of healthy tissue Tumours in the pyriform fossa are generally too advanced for excision by this means, and if operation is undertaken total laryngectomy with a portion of pharynx is required, but the method, can be applied to tumours in the post-cricoid region and the raw surface made good by turning a flap of skin from the neck into the pharynx A complete segment of the lower pharynx may then be reconstituted without interference with the larynx secondary plastic operation is necessary to close the opening into the side of the pharynx.

These operations are easily combined with a gland operation, which can be very radical if necessary, so that although conservative in relation to the larynx, they are directed to a radical removal of the tumour and its extensions. They give good results especially for tumours of the epiglottis and aryepiglottic folds without mutilation of the larynx.

This type of operation, however, does not even now meet with approval in the clinic of Gluck Gluck and Soerensen say: "We condemn most emphatically all attempts which aim at peeling the tumour off the larynx or extirpating it with single parts of the larynx. We see more and more, only and solely, that the one possibility of accomplishing a permanent cure lies in the sacrifice of the larynx with the diseased portion of the pharynx." Only for early tumours of the epiglottic is transverse subhyoid pharyngotomy allowed. This teaching applies to tumours of the pyriform fossa, which are usually advanced, but it is not necessary for many epilaryngeal tumours, and it renders difficult the important operation on the

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extension of the epithelioma. Extension to the ventricular band or arytenoid region is an indication for laryngectomy and in performing it care must be taken to remove a sufficient margin of the pharyngeal mucous membrane behind the arytenoids.

A large class of intrinsic growths therefore are amenable either to local excision after splitting the larynx or to some form or partial laryngectomy The first step in the operation should always be tracheotomy, after which the anæsthetic is continued through the tracheotomy cannula In the operation of laryngo-fissure, as soon as the larynx is opened the trachea is packed above the cannula thus preventing any blood from escaping into the lower air passages. The soft tissues on the side of the growth are elevated from the thyroid cartilage and divided above and below well away from the growth posterior cut, made with curved scissors, should pass through the vocal process of the arytenoid cartilage The ala of the thyroid cartilage may also be removed if more space is required. StClair Thomson has now made this a routine step in the operation, but it is not essential In partial laryngectomy when the growth has become adherent to the cartilage at the anterior commissure, the cartilage should be divided on each side of the middle line and not split as in laryngo-fissure The cartilage and sufficient underlying tissue surrounding the growth can then be removed in one piece. There is little risk in these operations, if hæmorrhage is properly controlled, because the field of operation does not extend to the pharynx

Tracheotomy is also an essential preliminary to lateral pharyngotomy, and as the cannula must be left in position for eight or ten days a window should be cut in front of the trachea to prevent pressure necrosis by the tube, and the thyroid isthmus

thyrotomy for intrinsic cancer, with three recurrences and one death from the operation. The operation of splitting open the larynx with local excision of the growth has, therefore, now taken the place of laryngectomy or hemi-laryngectomy in a large number of intrinsic tumours.

The majority of intrinsic tumours are situated on the anterior third or anterior two-thirds of one cord The most favourable cases for operation are those in which the cord is quite mobile and free from disease at either extremity Some surgeons limit the indications for the operation to such conditions, and thus obtain a high percentage of permanent cures (84 per cent) A cicatricial fixed cord forms and there is no mutilation of the larynx, which is capable of producing a strong voice If the movement of the cord is impaired the operation is still justifiable, but in a series of cases there will be a lower percentage of permanent results If the cord is quite fixed, showing invasion of the underlying muscles, less than half of the cases will be cured, so that complete fixation of the cord should be regarded as an indication for laryngectomy If the growth passes across the anterior commissure it is still possible to do a conservative operation by a modification of the operation whereby the anterior part of both cords is removed A large part of the front of the larynx may be removed without producing such stenosis as to call for permanent tracheotomy, and the patient remains in possession of a useful voice. If the disease is subglottic, or has extended downward into the subglottic region, excision by laryngo-fissure is sometimes feasible, but the results are uncertain and it is much safer to excise the larynx It is sometimes necessary m such cases to remove not only the larynx but two or three rings of the trachea with it in order to obtain an adequate margin of healthy tissue below the lower

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Inflammation of the Ethmoid.

BY HERBERT TILLEY, B.S., FRCS

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In considering the subject of inflammation of the ethmoidal sinuses, it is essential that the reader should, if necessary, refresh his knowledge of the somewhat intricate anatomy of the ethmoid bone and its relation to the important and even vital structures with which it is in close relationship. This can readily be done in any anatomical museum where dry and moist sections of cleft skulls are available; furnished with these and any modern textbook of anatomy, there should be no difficulty in following the subject-matter of this article. The chief features of the dry preparation which should be noted are as follows:—

(1) That the ethmoid bone occupies about one-half of the entire space between the roof and floor of the nasal cavities

(2) On its inner aspect will be seen three convex leaflike structures, viz, the inferior, middle, and superior turbinal bodies which overhang their respective and similarly named measures

(3) Behind the small superior turbinal is the spheno-ethmoidal

recess into which opens the "ostium" of the sphenoidal sinus

(4) In the narrow roof of the nasal cavity is the cribriform plate through which pass the olfactory nerve filaments to be distributed on the upper part of the central plate of the ethmoid and on the

medial aspect of the superior turbinal

(5) If the middle turbinal has been removed so as to expose the outer wall of the middle meatus, the prominent cell known as the "bulla ethmoidalis" will be seen and immediately below it a curvilinear or crescentic depression, the "hiatus semilunaris," in the lower part of which is situated the "estium" of the maxillary antrum. The anterior limb of the crescent inclines upwards and slightly forwards towards the fronto-nasal canal which leads into the frontal sinus.

6 Looking next at the inner wall of the orbit, there will be

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divided to prevent it from covering the opening if the cannula should slip out of the trachea

In total excision of the larynx tracheotomy is not necessary, unless the patient has already stridor or dyspinea. In that event a preliminary low tracheotomy is indicated eight or ten days before the laryngectomy. This renders the patient much safer from any pulmonary complication and relieves the surgeon of anxiety during the operation. Whether the larynx is removed from above, as recommended by Gluck, or from below, as was advised by Keen and Moure, and is performed by Mackenty by a modified technique, is immaterial, so long as there is no departure from the general principles already indicated, and the wound is adequately drained

The following plan gives a general outline of the indications for operation —

(1) Intrinsic Cancer

- (a) Limited to cord - - Laryngo-fissure Cord free at each extremity and mobile, or with slight loss of mobility -
- (b) Fixed cord - - Laryngectomy (c) Subglottic cancer - Laryngectomy
- (d) Invasion of anterior commissure with back of larvax free - Partial laryngectomy

(2) Extrinsic Cancer

- (a) Epithelioma of epiglottis - Lateral pharyngotomy (Subhyoid pharyngotomy in early cases Gluck and Socrensen)
- (b) Epithelioma of aryepiglottic fold Lateral pharyngotomy
- (c) Post-cricoid carcinoma - Lateral pharyngotomy
 with replacement by
 skin flap and plastic
 operation later
- (d) Pyriform fossa - - Pharyngo laryngectomy

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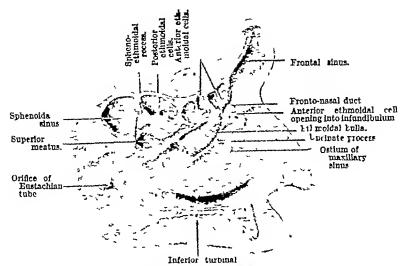


Fig 2—Outer wall of left nasal chamber after removal of superior and middle turbinals.

These anterior and posterior ethinoidal cells and their communications with the nose are thus exposed. The frontal sinus opens into the infimibilium, that channel being continued directly upwards to the sinus as a narrow and tortuous fronto nasal duct. The bulls ethinoidalis is very large, and the hintus semilunaris is in consequence narrow. Note also the prominence of the nasal crest, which encroaches on the lower anterior part of the frontal sinus, this would obstruct the passage of an instrument into the sinus.

(The drawing is from a dissection lent by Prof Symington to Dr Logan Turner, from whose work on "The Accessory Sinuses" it is reproduced

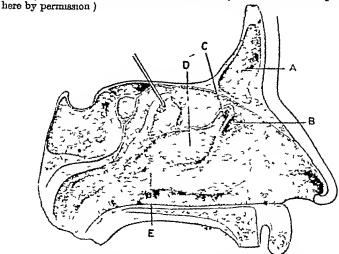


Fig. 3—A Frontal sinus B Agger cell. C Fronto nasal duct D Ethmoidal bulla E Accessory ostrum of antrum (From specimen dissected by the Author)

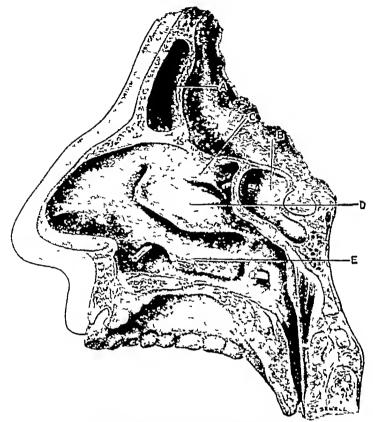


Fig 1—View of the outer wall of the right nasal fossa (from specimen in the Museum of University College Hospital)

A Frontal sinus
B Sphenoidal sinus

C Superior turbinal
D Middle turbinal

E Inferior turbinal A portion of the latter has been removed to insert a straw into the lower opening of the lacrymal duct. Another has been inserted into the naso pharyngeal orifice of the Eustachian tube, and a third rests in the natural communication between the sphenoidal sinus and the spheno ethmoidal recess.

seen the lacrymal bone, behind it the thin, smooth surface of the "os papyraceum" of the ethmoid bone, and posterior to this the orbital process of the palate bone. The optic foramen will sometimes be seen in close contiguity with a posterior ethmoidal cell

(7) The cells or sinuses are, in normal conditions, contained in the "lateral masses" or labyrinth of the ethmoid. They form an anterior and posterior group of cells which are divided from one another by a thin plate of bone continuous with the attachment of the middle turbinal. The anterior group of cells open into the middle meatus and the posterior group into the superior meatus. Consequently, the presence of a purulent discharge in either of these situations gives us a clue to the cell or group of cells which are infected.

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that the surgeon who undertakes to deal with inflammatory lesions of the ethmoid must have an intimate and practical knowledge of its structure and topographical relations as well as of the clinical and pathological aspects of its diseases. For in combating the affections of the nasal accessory sinuses the "key situation" is the ethmoid, and only if it be held and skilfully controlled can it be hoped to win through to ultimate success.

ETIOLOGY.

That the primary infection of the ethmoid is generally caused by organisms carried into the nose by the inspired air would seem to be proved by the frequency with which inflammation of an exposed portion of its structure follows one of the acute specific fevers, e.g. scarlet fever, measles, and particularly influenza. In other instances, ethmoiditis may result from a primary infection of the other paranasal sinuses.

PATHOLOGY

The milder cases of inflammation in which the muco-periosteum is affected, this tissue becomes swollen and ædematous, and sooner or later tends to form the well-known nasal polypus which is one of the chief characteristics of ethmoiditis

When the inflammation reaches the bony elements of the ethmoid, the activity of osteoblasts may bring about an increase of osseous tissue, while with a superabundance of osteoclasts a rarefying osteitis is produced. In advanced cases spicules of bone may be isolated and can frequently be detected by a blunt probe. It was to this condition that the late Edward Woakes applied the term "necrosing ethmoiditis," which the researches of Hajek and others proved to be an unfortunate and misleading nomenclature, because necrosis, implifying sequestrum

These anatomical features of the dry section should now be compared with those of a moist preparation. If one can also be obtained in which the blood vessels have been carefully exposed, it will be noticed that the ethmoidal veins pass into the superior or inferior ophthalmic veins and these terminate posteriorly in the cavernous sinus. Other ethmoidal veins in the neighbourhood of the oribriform plate anastomose with those of the dura mater and the longitudinal sinus

(8) It must be remembered that the nasal expansions of the olfactory nerve are enclosed in perineural lymphatic sheaths which pass through the embriform plate and thus communicate with

intracramal structures

(9) The ethmoidal sinuses vary in their number and tend to extend into surrounding regions, eg they may be found (a) Between the roof of the orbit and the floor of the frontal sinus (Fig 5), (b) mounding upwards behind the opening of that sinus into the nasal cavity, (c) in the middle turbinal (Figs 8 and 9), (d) on the postero-medial aspect of the roof of the maxillary antrum, (e) in the region of the "agger nasi" (Fig 3), and (f) occasionally invading the "crista galli" (Fig 5)

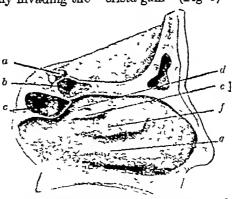


Fig 4.—a, optio nerve, b, posterior ethmoidal cell, c, sphenoida smus, d, spheno ethmoidal recess, c, f, g, superior, middle and inferior turbinals (By kind permission of Dr Ross Skillern, Philadelphia.)

(10) If a vertical section of middle turbinal be examined under a microscope, it will be noticed that muco-periosteum on its median aspect is thin and adherent, whereas it is lax and more abundant on the outer concave surface of the bone. Hence the polypoid-like ædema which is often to be seen in the anterior cleft of the middle meatus when acute or chronic ethnoiditis is present.

Such anatomical considerations will suffice to show

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membrane hypertrophies. These are accompanied by excessive secretion of mucus and varying degrees of nasal obstruction.

(2) The atrophic form involving the mucous membrane and its underlying bone. The former is often of a dull red colour and covered by thin crusts of inspissated secretions. A similar condition may often be noted on the inferior turbinal, in the nasopharynx, the oropharynx, and occasionally in the larynx If the disease be bilateral, the clinical picture may closely simulate atrophic rhinitis (ozæna).

Both the hyperplastic and atrophic forms of ethmoiditis may be complicated by suppuration, and such an added infection may be limited to one or more cells of either the anterior or posterior groups, or all the cells of both groups may suppurate In the latter case it will generally be found that the antrum, frontal, and sphenoidal sinuses share in the general pyogenic infection

Furthermore, the confinement of mucus or mucopus within a cell leads to its distension and the formation of a thin-shelled cystic swelling (Figs 8 and 9) This is

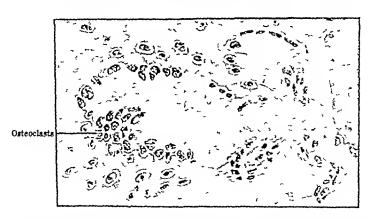


Fig. 7 —A large bay in the bone is seen, and the edge of this is indented and large esteoclasts occupy the indentations. The bone cells are numerous and larger than normal er than normal (Lack)
(By permission of proprietors of "Physician and Surgeon")

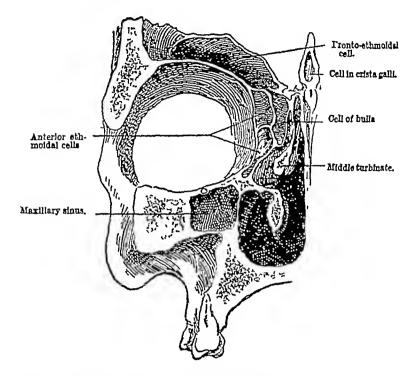


Fig 5—Fronto ethmoidal cell extending almost the width of the orbit Also cell in crists galli.

(By kind permission of Dr Ross Skillern, Philadelphia.)

formation, is rarely seen apart from syphilis, tubercle, or malignant disease. But it must not be forgotten



Fig 6 —o, osteoblasts
/, new bone
(Kindly lent by
Prof Hajek, Vienna)

that Woakes was the first to recognize and insist upon the relationship between nasal polypus and inflammation of the ethmoid bone—a fact which has long since been universally substantiated

As a result of inflammation of the muco-periosteal and bony elements of the ethmoid two distinct clinical types of ethmoiditis are frequently to be observed —

(1) The hyperplastic type characterized by the formation of nasal polypi and other high-grade mucous

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wards and outwards, with resulting diplopia Palpation of the more prominent parts of the swelling in its more advanced stages of growth will often give the sense of fluctuation or that of the so-called eggshell crackling. A mucocele may produce a very obvious external deformity without any visible intranasal lesion. Sometimes it is possible to reduce and cure the disease by an intranasal operation, but more frequently free intranasal drainage can only be secured by an external operation.

A third and much rarer form of ethmoiditis may occasionally be seen, viz that in which there is limited ulceration of bone. It is most frequently met with when septic thrombosis of an ethmoidal vein has spread into orbit and caused an orbital abscess. On exposing the inner wall of the orbit from the outside in order to release the pus, a small area of ulcerated or necrosed bone may be detected around the fistulous tract through which the infected vessel passed to join one of the ophthalmic veins

Before leaving this outline of the pathology of ethmoiditis, it would be well to emphasize that its visible signs often give no clue to the extent of the lesion, ie hidden signs of inflammation may only be revealed by the removal of those which are obvious

SYMPTOMS

It is often surprising to find that extensive disease of the ethmoid may be present without giving rise to very definite symptoms, possibly this may be explained by the thin, fragile, and yielding texture of the cells which communicate with one another and with their respective meatures and thus obviate undue retention of inflammatory products

When such free dramage is hindered various symptoms are complained of, such as a feeling of pressure or dull pain at the root of the nose, in the eyes, or in the lower frontal region. Any of these

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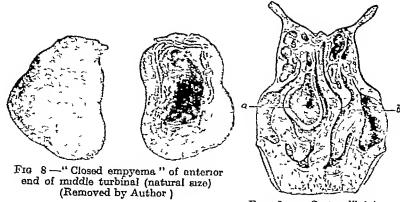


Fig. 9—a, Cystic dilatation of right middle turbinal b, Deviation of septum

not uncommon in the middle turbinal and the "bulla" of the ethmoid Such a collection of pus retained within its cell is known as a "closed" empyema, but when, as is more frequent, it discharges from the natural opening, the term "open" or "manifest" empyema is used.

A less common result of defective drainage from one or more anterior ethmoidal cells is the formation of a mucocele (Fig. 10) This takes the form of a painless



Fig. 10—Right ethmoidal mucocele (Kindly lent by Dr. Logan Turner)

and very slowly growing tumour which first appears above the internal canthus, and later may extend upwards and outwards towards the floor of the frontal sinus. When fully developed its encroachment on the orbital recess may cause the eye to be pushed down-

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ethmoidalis," or a distended cell in the middle turbinal, vide Figs. 8 and 9 To expose these fully a long-bladed speculum should be passed into the meatus or, if necessary, the middle turbinal removed.

Any reference to the effect of ethmoiditis on the nervous system naturally leads one to think of it as one of the factors in those more serious types of mental disorder such as are found in our asylums.

In this connection Dr. William Hunter has expressed the view that the incidence of chronic sepsis among the insane is much higher than in any group of hospital patients, and he referred to 200 cases successfully treated by removal of focal infection by Dr. Cotton of New Jersey (U.S.A.) He advocates that every mental hospital should be fully equipped for surgical and specialist work in order to deal with the "septic psychoses"

Dr T. C. Graves and Dr F A Pickworth, of the Birmingham Mental Hospital, have given much attention to the relation between nasal smus disease and mental disorder. The former has described five cases of insanity, four of which were cured by relief from the smus trouble, and stated that 50 per cent of the cases admitted to the mental hospitals showed infective foci in the nose and throat. Dr Pickworth has reported (Journal of Laryngology and Otology, 1928) on eleven post-mortem specimens removed from insane patients, in all of which gross infective disease of the sphenoidal muses could be demonstrated. Dr P. Watson Williams devoted his Semon Lecture (1925) to the same subject.

If space permitted one would like to discuss the connection between ethmoidal inflammation and diseases of the eye. It is too large and important a subject to embark on here, but in referring to it I would like to state that I have had many experiences which lead me to believe that ethmoiditis is frequently associated with serious lesions which affect the

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may attain great severity with the advent of an acute coryza. In 1925 I was able to cure a case of severe and chronic trigeminal neuralgia by the removal of a caseous mass of inflammatory products from the right anterior ethmoidal cells. Not infrequently such symptoms are associated with mental depression, lack of the power of concentration, and of that congery of symptoms which is often labelled "neurasthenia."

When ethmoidal disease of the hyperplastic type is associated with nasal polypi or other high-grade hypertrophies of the mucosa, the chief complaint may be nasal obstruction with catarrhal symptoms such as are usual with "chronic cold in the head" Examination of the nasal cavities may reveal not only one or more polypi, but a purulent or mucopurulent discharge in their immediate neighbourhood.

In the atrophic type the patient may seek relief from the annoyance caused by crust formation in the nose or in the nasopharynx, and such secretions are often difficult to dislodge especially on waking in the morning. A careful examination of the cells underlying an adherent crust will often enable the surgeon to discover that one or more of them are suppurating, and a blunt probe may detect small, limited areas of exposed and carious bone. In both hypertrophic and atrophic ethmoiditis the patient will frequently state that the sense of smell is lost, or diminished to a greater or less degree. This may be due to obstruction by polypi or to degenerative changes in the olfactory nerves.

"Cacosmia" or a feetid discharge is not uncommon when pus is retained in a cell and destruction of its bony elements are taking place. This symptom is most likely to occur in atrophic ethmoiditis, and its source will not infrequently be found in the cells which border on the middle meatus, e.g. the "bulla

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cauterized by acids or the galvano-cautery. No plugging should be applied to the ethmoidal regions When a fair clearance has been made at the first operation, no further removal should be undertaken before an interval of at least a week in order that the resulting traumatic ædema has had time to subside and thus afford a clearer field for a second intervention, if this prove to be necessary.

In such case if it be impossible to do further work with a snare, some form of ethinoidal forceps will be necessary in order to clear the middle meatal regions. These can be inspected further by means of a long-bladed speculum, or the removal of a part or the whole of the middle turbinal may be advisable. The best pattern of forceps will be that which the operator has accustomed himself to use Having done this, the surgeon should open up any infected cells in the immediate vicinity until he is satisfied that he has reached those that are normal.

So much for the milder cases in which the disease is more or less limited to the immediate neighbourhood of the middle meatus. When polypoid degeneration involves the posterior group of cells, or even the whole of the ethmoid labyrinth, more extensive and radical operations will be required, such as have been intro-

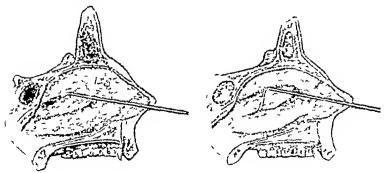


Fig. 11—Sluder's method—kinfe or sharp hook incision Fig. 12—Sluder's method—removal of turbinate with snare (Kindly lent by Dr. Ross Skillern.)

internal structures of the eye and the optic nerve With regard to orbital cellulitis it will be probably correct to state that in the large majority of cases it is caused by infection from the adjacent ethmoidal cells.

DIAGNOSIS.

In the hyperplastic forms with nasal polypus and other mucous membrane hypertrophies the diagnosis of ethmorditis will be obvious If suppuration be present an endeavour should be made to establish its source and to bear in mind the possible involvement of the other paranasal sinuses-frontal, antral, or sphenoidal In making the search a long-bladed speculum inserted into the middle meatus will be necessary, and possibly infraction or partial removal of the middle turbinal If a localized "closed" empyema be present a lateral radiogram may help in its location and outline its extent In atrophic forms of ethmoiditis, dried secretion should be removed with forceps when examination of the underlying parts made with a probe may reveal a suppurating cell or evidences of rarefying osteitis Should opportunity offer it will be well to make one of the examinations during an acute exacerbation of symptoms because otherwise mactive toci of inflammation may then become obvious

TREATMENT.

This will be based on the general principle of providing inflamed areas with free, spontaneous, and permanent drainage, and this whether suppuration be present or absent.

Under local anæsthesia secured by cocaine and adrenalin solutions, large or moderate-sized polypi can be removed by the cold wire snare. When the loop is tightened up the polypus should be pulled, rather than cut off, in order that the inflamed bone at the base of the polypus may possibly be removed at the same time. The origin of such polypi should not be

INFLAMMATION OF ETHMOID

cauterized by acids or the galvano-cautery. No plugging should be applied to the ethinoidal regions. When a fair clearance has been made at the first operation, no further removal should be undertaken before an interval of at least a week in order that the resulting traumatic ædema has had time to subside and thus afford a clearer field for a second intervention, if this prove to be necessary.

In such case if it be impossible to do further work with a snare, some form of ethmoidal forceps will be necessary in order to clear the middle meatal regions. These can be inspected further by means of a long-bladed speculum, or the removal of a part or the whole of the middle turbinal may be advisable. The best pattern of forceps will be that which the operator has accustomed himself to use. Having done this, the surgeon should open up any infected cells in the immediate vicinity until he is satisfied that he has reached those that are normal.

So much for the milder cases in which the disease is more or less limited to the immediate neighbourhood of the middle meatus. When polypoid degeneration involves the posterior group of cells, or even the whole of the ethmoid labyrinth, more extensive and radical operations will be required, such as have been intro-

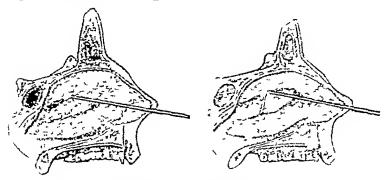


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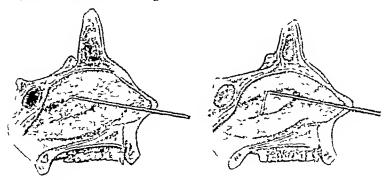


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away all visible disease, an interval of about a week should be left for reactionary swelling to subside, when it may be necessary to remove any tags of mucous membrane which may be present, to insert lightly a wick of gauze moistened with argyrol (15 per cent. solution), and leave it in position for two or three hours. I have found it the most satisfactory local application for wounded surfaces in the nasal cavities.

When ethmoidal disease is complicated by an



Fig 15 -External incision

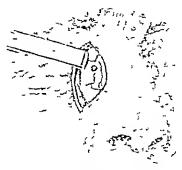


Fig 16—Exposure of anterior ethmoidal region

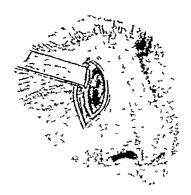


Fig 17—Completed operation on anterior ethmoidal region; the ostium of the sphenoidal sinus is seen deep in the wound (By kind permission of Dr Ross Skillern)

external suppurating fistula, an operation from outside will almost always be necessary A curved incision is made, commencing behind the inner margin of the

duced by Ballenger, Mosher, Sluder, Hajek and others. The principle of these methods is practically the same although they vary in technical details. They

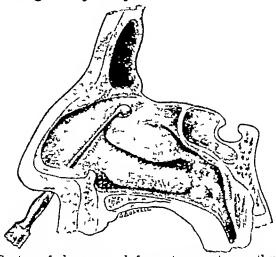


Fig 13—Position of sharp spoon before entering anterior ethmoidal cells. The middle turbinal has been left in position in order to illustrate the exact point of application of the spoon or curette (From specimen dissected by author)

involve removal of the middle turbinal and exenteration of the labyrinthine cells by specially curved knives, hooks, forceps or curettes

After removal of the middle turbinal and clearing

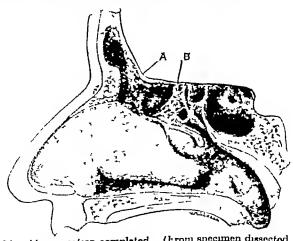


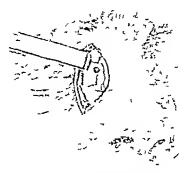
Fig 14.—The operation completed (From specimen dissected by author)

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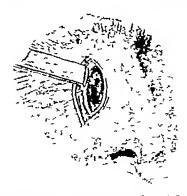


Fig 17—Completed operation on anterior ethmoidal region, the ostium of the sphenoidal sinus is seen deep in the wound. (By kind permission of Dr Ross Skillern)

external suppurating fistula, an operation from outside will almost always be necessary. A curved meision is made, commencing behind the inner margin of the

supra-orbital ridge about \(\frac{3}{4} \) in above the mediam canthus and prolonged downwards in front of this, and then slightly outwards on to the ascending process of the superior maxillary bone. The soft tissues and the periosteum are now turned outwards, including the undamaged lacrymal sac, until the orbital aspect of the ethmoid bone is fully exposed. The bony fistula will then be detected, and by breaking down the inflamed cells which surround it a free communication should be established with the nasal cavity. The external wound can be partially or completely sutured according to the presence or absence of inflammation in the soft tissues.

COMPLICATIONS

Those who have for many years kept in touch with the literature of rhinology and who, at the same time, have enjoyed the confidences of their co-workers at home and abroad, will probably agree that operations on the ethmoid have provided as many, or more serious and fatal complications than those performed on all the other sinuses put together. I also think they will be unanimous in that the operative risks are greater when suppuration complicates any type of ethmoiditis. By "serious complications" are meant, of course, such disasters as extensive orbital cellulitis, possibly ending with blindness, cavernous sinus thrombosis, and acute septic meningitis

It is my custom, in order to minimize such operative risks, to lay down the following rules for my own as well as for the observation of junior officers who assist me in my hospital work.—

(1) By the application of cocaine and adrenalin to secure the most effective ischemia possible before commencing to remove diseased areas, and this even in the case of simple polypi

(2) As far as is humanly possible, to see the affected

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tissues before and while they are being removed If bleeding is so free as to prevent this, and if it cannot be checked, the operation should be suspended to wait for another opportunity.

- (3) How long shall be the delay? At least a week, because the first intervention will have produced a reactionary cedema and possibly stimulated some hidden focus of inflammation which may extend beyond control if prematurely interfered with. This will be more likely when suppuration is present in the operated area.
- (4) The following I regard as the golden rule in radical ethmoidal operations. Always strive to preserve and keep in view the attachment of the middle turbinal to the "lateral mass" of cells, and to work on its external aspect whether such action leads above or below its level. For myself it is the one essential landmark, and if—as may frequently happen—it has to be removed to gain freer access to the posterior group of cells, then additional caution will be necessary and trust placed in one's sense of orientation and knowledge of the local anatomy.
- (5) The surgeon should do all in his power to avoid damaging the olfactory mucous membrane on the upper reaches of the septum and the medial aspect of the superior turbinal because the nerve expansions are here surrounded by lymphatics and infection may easily enter them. Fig. 18 has been kindly lent to me by my friend Dr. Logan Turner, and it shows how a fatal meningitis was caused by septic organisms gaining entry by the olfactory nerve sheaths.
- (6) After the primary operation no packing should be placed against the operated areas because free and spontaneous drainage is an absolute essential if risks are to be avoided. Hæmorrhage is rarely a serious complication.

Finally, "Let us hear the conclusion of the whole

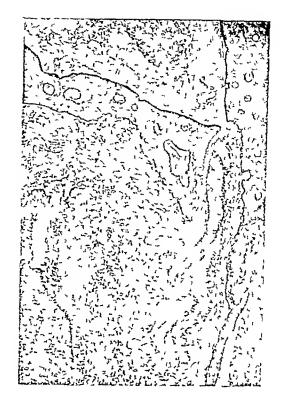


Fig. 18—Roof of right nessal cavity showing cribriform plate and opening and the inflamed nasal mucous membrane. An olfactory norve with purulent infiltration of its sheath is seen in the nasal mucous membrane and the dura mater. (Kindly lent by Dr. Logan Turner.)

matter" Of the ethmoidal region it may truly be said that its mazes are intricate and often fai-reaching, so that when inflammation enters them, its accurate localization will often tax the diagnostic acumen of the most experienced rhinologist, and a knowledge of the risks involved in its radical treatment should steady the hand of the boldest operator

He who attacks inflammatory diseases of the ethmoid labyrinth without an accurate knowledge of its anatomy and pathology, such as I have referred to in my opening remarks, must surely hold very lightly the safety and sanctity of human life

Some Historical Considerations on the Removal of Tonsils.

BY FRANCIS R PACKARD, M.D.

Philadelphia

Editor of the Annals of Medical History

IN the reign of the Roman Emperor Tiberius there lived a man who wrote an encyclopædia in which, although not himself a medical man, he embodied a treatise on medicine, which has preserved for us much information concerning the current practice of medicine, which would otherwise have been lost. This was Aulus Cornelius Celsus, who was born about a quarter of a century before the Christian era and died about AD. 50 In his De Medicinâ he writes of "indurated tonsils," that they result from inflammation, and that, as they are only covered by a very thin membrane, to remove them it is only necessary to separate them all around with the fingers and lift them out, in other words enucleate them with the fingers. If this is not possible Celsus says the tonsils should be grasped with a hook and excised with a bistoury Following this the wound should be washed with vinegar, "and the proper remedies used to arrest the hæmorrhage" There is a great smack of modernity in this brief monograph on the tonsils by this Ancient.

One of the earliest writers of antiquity to describe an operative procedure for the removal of the tonsils was Paulus Aegineta, or Paul of Aegina, who lived in the seventh century, the following is his section on Antiades or indurated tonsils. "As indurated glands are called strumæ, so the almonds of the ears when inflamed, swelled, and, as it were, dried,

occasioning difficulty of deglutition and of breathing. are called antiades, from their being placed opposite one another. When, therefore, they are inflamed we must not meddle with them. but when the inflammation is considerably abated, we may operate, more especially upon such as are white, contracted, and have a narrow base. But those which are spongy, red, and have a broad base, are apt to bleed. Wherefore, seating the person in the light of the sun, and directing him to open his mouth, while one assistant holds his head, and another presses down the tongue to the lower law with a tongue spatula, we take a hook (tenaculum) and perforate the tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to that hand, called ancylotomus, for there are two such instruments having opposite curvatures. After the incision of one we may operate upon the other inversely in the same manner. After the operation the patient must gargle with cold water or oxycrate, and if any hemorrhage comes on he may use a tepid decoction of brambles, roses, and myrtle-leaves; or if the blood flows copiously we must give for a gargle the juice of plantam and comfrey, and the trochisk from amber and the Lemnian earth, dissolved in oxycrate When the hæmorrhage stops, the parts on the next day may be anomted with the flower of roses, saffron, and starch with milk, or with water, the white of an egg, or hydrorosatum. When sordes collect about the ulcers. we may use injections and linctuses made from honey"

In the eleventh century Albucasis, the great Arabian surgeon, advised that enlarged tonsils should be removed. Using a spatula to depress the tongue, he drew the tonsil out with a tenaculum and then excised it with a curved bistoury or scissois. Like all the Arabians, Albucasis was a great advocate of the

REMOVAL OF TONSILS

actual cautery, which he recommended as one means for the removal of the tonsils The methods employed by Paul of Aegineta and Albucasis continued to be used for the removal of tonsils for many centuries

It is curious to note that Ambroise Paré (1510–1590) in his encyclopædic writings on surgery does not refer to any method for the removal of the tonsils; but Richard Wiseman (1622–1676), the famous surgeon to Charles II, describes the methods which he employed and relates the histories of some of his cases. After drawing the tonsil out as far as possible, he placed a ligature around its base and then excised it with ligatures. Wiseman also frequently used escharotics and the actual cautery when he had reason to fear hæmorrhage or when the tonsil was very adherent.

It is well known that excision of the uvula was frequently practised in the most ancient times. Thomas Bartholm in 1641 appears to have been the first to describe a cutting instrument especially devised for this purpose. All the earlier accounts of methods employed for uvulotomy were by the bistoury, scissors or snare. The great French surgeon, Desault (1745-1795), seems to have been the first to use a special instrument for the removal of the tonsils. It was a modification of an instrument known as the cystotome or "kiotome," which was used for dividing cysts of the bladder, consisting of a metallic sheath cut into the shape of a half moon at one end and with two rings at the proximal extremity by which it could be held. A knife blade was arranged so as to pass through the sheath across the half moon notch after the latter had been adjusted to the tonsil, which was drawn into it by means of a hook. Desault's instrument was not generally adopted and lapsed into innocuous desuetude. Morell Mackenzie quotes Heister's views in regard to the operation of tonsillectomy from his "General System of Surgery," London, 1768, in which

that great surgeon wrote. "This operation is not only too severe and cruel, but also too difficult in the performance, to come into the practice of the moderns, because of the obscure situation of the tonsils."

One method, though, perhaps, hardly operative, popular with many surgeons, even down to the middle of the nineteenth century, was that of ligation. A tight ligature was passed around the tonsil and gradually tightened until the tonsil sloughed off No better account of this method remains than that written by Fanny Kemble in "Records of Later Life,' January 8, 1838, from Philadelphia: "S---'s scarlet fever had been followed by the enlargement of one of the tonsils, which grew to such a size as to threaten suffocation, and the physician decided that it must be This was done by means of a small doublebarelled silver tube, through the two pipes of which a wire is passed, coming out in a loop at the other end of the instrument This wire, being passed round the tonsil, is tightened, so as to destroy its vitality in the course of twenty-four hours, during which the tube remains projecting from the patient's mouth, causing some pain and extreme inconvenience usually resorted to with adults (for this, it seems, is a frequent operation here) is cutting the tonsil off at once: but as hæmorrhage sometimes results from this, which can only be stopped by cauterizing the throat that was not to be thought of with so young a patient

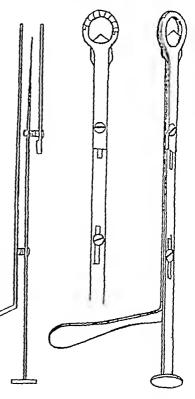
At the end of the twenty-four hours the instrument is removed, the diseased part being effectually killed by the previously tightening of the wire. It is then left to rot off in the mouth, which it does in the course of a few days, infecting the breath most horribly, and, I should think, injuring the health by that means."

In 1820, P. S Physick (1768–1837), of Philadelphia, who had been a pupil of John Hunter's and a house

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surgeon at St George's Hospital before getting his medical degree at Edinburgh, and was the most scientific surgeon of his time in the United States, published an account of the method which he employed for the removal of "scirrhous" tonsils by means of strangulation with a soft wire carried around the tonsil by a double cannula. In 1828 Physick reported "A Case of Obstinate Cough, occasioned by elongation of the Uvula, in which a portion of that organ was cut off, with a description of the instrument employed for that purpose, and also excision of scirrhous tonsils" In this article he stated that he had found the amputation of the uvula with scissors, which he had previously

used. unsatisfactory. nor did he find the various types of uvulotome in ordinary use the purpose answer much better He therefore constructed a uvulotome modified from the one described by Benjamin Bell in his "System of Surgery." Physick's guillotine had two plates, instead of one, the knife sliding A strip between them of waxed linen passed around the posterior semi - circumference of the aperture, so as to obviate not cutting clean through the tissues, the waxed linen supporting and holding it. By increasing the



Tonsillotome (half-size) of Physick, 1828 (Friedberg)

size of the aperture in the guillotine he found he con adapt it to the removal of the tonsils Physick water of the operation that it is "easy to cut off the w" ile or any portion that may be necessary of the enlargetonsil in this manner. The operation can be finished in a moment of time. The pain is very little, and the hæmorrhage so moderate that it has not required any attention in four cases in which the doctor has lately performed it." The article was accompanied by a plate with three drawings of the instrument suggestion was eagerly followed up by many of his American colleagues, and several of them devised modifications of his instrument Thus John K. Mitchell devised a spear sliding through a socket on the handle, to transfix the tonsil and hold it while being cut out. This was a very original feature, as Physick relied on a vulsellum or forceps to draw the tonsil into the aperture of the guillotine and fix it William B. Fahnestock introduced a guillotine with a prong or fork, which maintained its popularity in the United States down to the early years of the present century, although the instruments sold as "Fahnestock's tonsillotomes" were so modified and changed as time went on that they were very different from the original type.

Morell Mackenzie should really be regarded as the founder of the modern tonsil operation. His guillotine was a modification of that devised by Physick, plus many improvements, and in his hands the technique of the operation was greatly improved, and he did much to popularize the operation by the excellent results achieved by his methods

Until the first years of the twentieth century the guillotine was the favoured instrument for the removal of the tonsil, but as the necessity for the removal of the entire tonsil became more apparent, the fact that frequently after the guillotine operation some tonsil

REMOVAL OF TONSILS

tissue remained to cause subsequent trouble resulted in a search for a technique which should provide against this contingency. The wire snare was advocated by many tonsillectomists and in the United States it is still preferred in one form or another by many operators The use of the snare is necessarily preceded by the freeing of the tonsil from adjacent structures by a kmife or dry dissector. In 1910 S S Whillis and F. C. Pybus, of Newcastle-on-Tyne, described a method of enucleation of the tonsil with the guillotine, which in their hands had resulted in complete extirpation without undue hæmorrhage or other complications in many hundreds of cases They employed Lennox Browne's modification of the Mackenzie guillotine. The chief feature in the technique of the operation on which they insisted was pushing the tonsil outward and into the aperture of the guillotine by pressure on the anterior pillar of the fauces with the finger. By this means the tonsil was lifted from its bed and pushed well through the aperture of the guillotine, and could then be severed at its base Two years later, in 1912, the late Greenfield S. Sluder, of St Louis, published a paper entitled, "A Method of Tonsillectomy by means of the Alveolar Emmence of the Mandible and a Guillotine" He used a Mackenzie guillotine, slightly modified, with an elliptical aperture He stated that the sahent feature of the operation was, "The dislocation of the tonsil out of its anatomical markings on the lower jaw to which I have given the name, 'Alveolar Emmence of the Mandible'." Sluder's paper was originally read at a meeting of the American Medical Association on June 9, 1910 A brief record of that presentation appears in the Journal of the American Medical Association, July 2, 1910 explains the non-publication of his article by stating that he had but lent his manuscript and drawings to Dr Ballenger, who was then bringing out the third

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REMOVAL OF TONSILS

tissue remained to cause subsequent trouble resulted in a search for a technique which should provide against this contingency. The wire snare was advocated by many tonsillectomists and in the United States it is still preferred in one form or another by many operators The use of the snare is necessarily preceded by the freeing of the tonsil from adjacent structures by a knife or dry dissector. In 1910 S S Whillis and F. C Pybus, of Newcastle-on-Tyne, described a method of enucleation of the tonsil with the guillotine, which in their hands had resulted in complete extirpation without undue hæmorrhage or other complications in many hundreds of cases They employed Lennox Browne's modification of the Mackenzie guillotine. The chief feature in the technique of the operation on which they insisted was pushing the tonsil outward and mto the aperture of the guillotine by pressure on the anterior pillar of the fauces with the finger. By this means the tonsil was lifted from its bed and pushed well through the aperture of the guillotine, and could then be severed at its base Two years later, in 1912, the late Greenfield S Sluder, of St Louis, published a paper entitled, "A Method of Tonsillectomy by means of the Alveolar Emmence of the Mandible and a Guillotine " He used a Mackenzie guillotine, slightly modified, with an elliptical aperture He stated that the salient feature of the operation was, "The dislocation of the tonsil out of its anatomical markings on the lower jaw to which I have given the name, 'Alveolar Eminence of the Mandible'." paper was originally read at a meeting of the American Medical Association on June 9, 1910. A brief record of that presentation appears in the Journal of the American Medical Association, July 2, 1910 Sluder explains the non-publication of his article by stating that he had but lent his manuscript and drawings to Dr Ballenger, who was then bringing out the third

size of the aperture in the guillotine he found he could adapt it to the removal of the tonsils Physick writes of the operation that it is "easy to cut off the whole, or any portion that may be necessary of the enlarged tonsil in this manner. The operation can be finished The pam is very little, and the in a moment of time hæmorrhage so moderate that it has not required any attention in four cases in which the doctor has lately performed it" The article was accompanied by a plate with three drawings of the instrument. Physick's suggestion was eagerly followed up by many of his American colleagues, and several of them devised modifications of his instrument John K Thus Mitchell devised a spear sliding through a socket on the handle, to transfix the tonsil and hold it while being cut out This was a very original feature, as Physick relied on a vulsellum or forceps to draw the tonsil into the aperture of the guillotine and fix it William B Fahnestock introduced a guillotine with a prong or fork, which maintained its popularity in the United States down to the early years of the present century, although the instruments sold as "Fahnestock's tonsillotomes" were so modified and changed as time went on that they were very different from the original type.

Morell Mackenzie should really be regarded as the founder of the modern tonsil operation. His guillotine was a modification of that devised by Physick, plus many improvements, and in his hands the technique of the operation was greatly improved, and he did much to popularize the operation by the excellent results achieved by his methods

Until the first years of the twentieth century the guillotine was the favoured instrument for the removal of the tonsil, but as the necessity for the removal of the entire tonsil became more apparent, the fact that frequently after the guillotine operation some tonsil

Tonsillomycoses:

A Brief General Account.

BY SIR ALDO CASTELLANI, Hon KCMG, DSC, MD, FRCP

Director of Tropical Medicine, Ross Institute for Tropical Diseases, Physician, Ross Hospital and Italian Hospital, Lecturer, London School of Hygiene and Tropical Medicine, Professor of Tropical Medicine, Tulane University of New Orleans, U.S.A.

Several colleagues who specialize in throat diseases have pointed out to me that very little is found in textbooks of their speciality or in textbooks of general medicine on diseases of the tonsils caused by fungi. It is at their suggestion that I venture to give in this article a brief general account of tonsillomycoses, based principally on my own clinical and mycological observations.

The term "tonsillomycosis" is used to denote any affection of the tonsils due to fungi A fairly complete botanical description of the fungi usually found in tonsillomycoses was given in my Gehrmann Lectures on "Fungi and Fungous Diseases," Chicago, 1926. and a botanical description of most of them will also be found in Castellani and Chalmers' "Manual of Tropical Medicine," 3rd edition It will suffice to mention here that fungi or mycetes differ from bacteria principally in that they are of larger dimenand always reproduce by spores From a practical point of view, fungi pathogenic to man may be separated into two large groups the Budding Fungi (yeasts and yeast-like organisms), and the Filamentous Fungi The budding fungi appear as round or oval cells, some of them budding, the filamentous fungi are characterized by the presence of filaments (hyphæ, mycehal filaments)

The budding fungi found in cases of tonsillomycosis

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TONSILLOMYCOSES

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generally belong to the following genera: Monilia Persoon, 1797; Cryptococcus Kutzing, 1833; Saccharomyces Meyen, 1838, Debaryomyces Klöcher, Willia

Fig. 1 —Principal types of fungi found in Tonsillomycoses

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		A Merhius				

I Cryptococcus II. Saccharomyces

III Debaryomyces
IV Mondia.

V Willia
VI. Ordium (sensu Pinoy)
VII Hemispora
VIII Nocardia (Streptothrix)

Hansen, 1904, Endomyces Rees, 1870 Fungi of the genus Montha Persoon are characterized by the presence of a large number of free budding cells and a very small amount of mycelium, ascospores (spores borne maide a special cell or ascus) are absent Fungi of the type Cryptococcus are characterized by the presence of budding cells without mycelium, ascospores are absent Fungi of the genus Endomyces have the same characters as Monilia, but ascospores are present Fungi of the genus Saccharomyces have the same characters as those of the genus Cryptococcus, but ascospores are present Fungi of the genus Willia are characterized by the ascospores having a peculiar bowler-hat shape In fungi of the genus Debaruomuces the ascospores have a verrucose surface

The characters of the principal Moniliæ, the fungi most commonly found in tonsillomycoses due to yeastlike organisms, are collected in the following table —

TONSILLOMYCOSES

parte

Etrology.—In the great majority of cases the condition is due to yeast-like fungi of the genus Monilia (Tonsillomoniliasis), in some cases to yeast-like fungi of the genus Cryptococcus (Tonsillocryptococcosis), and in a few cases to fungi of the genus Saccharomyces (Tonsillosaccharomycosis); occasionally to fungi of the genus Debaryomyces (Tonsillodebaryomycosis), of the genus Willia (Tonsillowilliasis), of the genus Endomyces (Tonsilloendomycosis) The condition is very rarely caused by fungi of the genera Trichosporum and Hemispora (Tonsillotrichosporosis, Tonsillohemisporosis) Occasionally fungi of the genera Nocardia, Cohnistreptothria, Vibriothria, have been found

Symptomatology —On the surface of the tonsils several whitish-grayish, or whitish-yellowish spots are

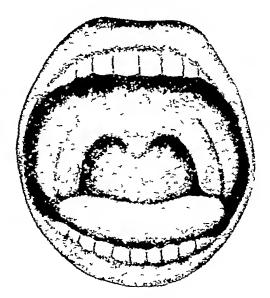


Fig 2 -Tonsillomycosis follicularis

seen, corresponding to the openings of the follicles The patient complains of a sore throat and discomfort

With regard to filamentous fungi, those found in tonsillomycoses are usually of the genus Nocardia Tom and Trevisan, 1889 (Streptother, Discomyces, Actinomyces), Oidium (sensu Pinoy, Castellani and Chalmers) and Hemispora (Vuillemin) The fungi of the type Nocardia are very slender, bacillus-like, one micron or less in breadth, they are often Grampositive, and some of them are acid-fast of the type Oidium show mycehal filaments which are of much larger dimensions than in Nocardia of the mycelial articles show a close segmentation, the segments later becoming free (arthrospores) fungi of the type Hemispora a portion of the hypha becomes enlarged and ampulliform-protoconidium, and in this segmentation takes place, and square-like spores are formed (deuteroconidia)

Tonsillomycoses may be classified in different ways it may be a purely etiological classification or histopathological or clinical. As the same clinical syndrome may be caused by a large number of different fungi, from a practical point of view a clinical classification is probably best. Clinically, tonsillomycoses may be separated into two large groups:—

- (1) The acute tonsillomycoses
- (2) The sub-acute and chronic tonsillomycoses

Of the acute tonsillomycoses, the two principal types are the following —

- (a) The follicular type (Tonsillomycosis follicularis)
- (b) The membranous or diphtheria like type (Tonsillomycosis membranacea, Tonsillomycosis diphtheriasimilis)

FOLLICULAR TONSILLOMYCOSIS (TONSILLOMYCOSIS FOLLICULARIS)

Synonyms —Tonsillomycosis follicularis, pro parte, tonsilloblastomycosis follicularis, pro parte, tonsillooidiosis follicularis, pro parte, tonsillomoniliasis, pro

TONSILLOMYCOSES

fungi of the genus Monilia The species found are in most cases of the Monilia metalondinensis type, pinoyi



Fig. 3 -- Mondia metalondinensis Castellani, 1916 Peptone Walter culture X 750

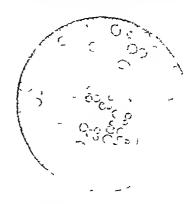


Fig. 4 -Moniha metalondinensis Castellani, 1916 Glucose agar culture X 750

type, tropicalis and metatropicalis type. In a few cases fungi of the genus Cryptococcus, Debaryomyces, Wilha, Saccharomyces are present

Symptomatology — The onset is often sudden, with a severe sore throat and difficulty in swallowing; the patient feels very ill and complains of great prostration and sometimes rheumatoid pams in the joints, fever is present and may be fairly high (102° to 103° F) Some of the cervical glands may be swollen and tender. The inspection of the throat will show cream-white patches on the tonsils, the uvula and occasionally the soft palate. the patches often coalesce moval of portions of these patches may leave a very slightly ulcerated bleeding



Fig 5 -- Moniha metalondinensis (Glucose agar culture)

in swallowing; there may be fever, but the general condition seldom becomes serious, and the affection usually heals spontaneously within one to three weeks. Occasionally, the mycotic infection spreads to the uvula and soft palate, forming diffuse white patches, and the condition becomes indistinguishable from the diphtheria-like type of tonsillomycosis, in other cases the mycotic infection spreads from the tonsils all over the oral mucosa. An interesting case of this type has been described recently by Muggia, who isolated from it Montha metatropicalis Castellani.

Diagnosis —This is based on the microscopical and cultural examination of the patches Usually a large number of yeast cells are found, while streptococci and other cocci and spirochaetes are absent, or present in very small numbers only. In a few cases, when the condition is caused by fungi of the genera Oidium (sensu Pinoy), Trichosporum and Hemispora, mycelial filaments are abundant, while budding cells are few or absent.

Prognosis —Usually favourable

Treatment.—At times the local application of glycerm of borax, or of solution of carbolic acid 1 m 20, is sufficient; in many cases diluted tincture of iodine (1 in 2, 1 m 4) is useful. Internally salicylates, aspirin, phenazon, pyramidon may be given. In the cases which do not clear up quickly potassium iodide should be administered or collosol iodine.

Diphtheria-like Tonsillomycosis (Tonsillomycosis Membranacea vel Diphtheriasimilis)

Synonyms—Tonsillomoniliasis diphtheriasimilis, pro parte, acute diffuse tonsillomoniliasis, pro parte, acute diffuse tonsillosaccharomycosis pro parte, acute diffuse tonsillocryptococcosis pro parte, malignant thrush of fauces.

Etiology —The disease is usually caused by yeast-like

TONSILLOMYCOSES

fungi of the genus Momha The species found are in most cases of the Monilia metalondinensis type, pinoyi



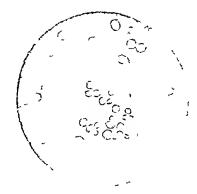


Fig. 3 — Monilia metalondinensis Castellani, 1916 Peptone Walter culture X 750

Fig. 4 —Monilia metalondinensis Castellani, 1916 Glucose agar culture

type, tropicalis and metatropicalis type In a few cases fungi of the genus Cryptococcus, Debaryomyces, Willia, Saccharomyces are present

Sumptomatology -The onset is often sudden, with a severe sore throat and difficulty in swallowing, the patient feels very ill and complains of great prostration and sometimes rheumatoid pains in the joints, fever is present and may be fairly high (102° to 103° F) Some of the cervical glands may be swollen and tender. The inspection of the throat will show cream-white patches on the tonsils, the uvula and occasionally the soft palate, the patches often coalesce. Removal of portions of these patches may leave a very slightly ulcerated bleeding



Fig 5 --- Monilia metalondinensis (Glucose agar culture)

If the membrane-like structure is placed between two slides it often feels like putty, and lacks the elasticity and resiliency of a diphtheria pseudomembrane



Fig. 6—Tonsillomycosis membranacea (T. diphtheriasimilis)

Case 1 —On August 5, 1921, Pensioner N (Ministry of Pensions Hospital, Orpington) developed tonsillitis with a temperature 102° F, a rapid pulse rate, and prostration The inspection of the throat showed a white membrane on the tonsils and fauces It was easily detached, but re-formed Neither in the direct smear nor by culture methods, were diphtheria bacilli found. In the direct smear, made at the bedside, were a large number of monthas From cultures on Löffler's medium and glucose agar, a moniha was grown at 37° C, and isolated in pure culture It turned out to be Monilia metalondinensis Castellani, producing gas in glucose, lævulose, maltose and galactose The patient made a good recovery after using a chlorine gargle

Case 2 - A Sinhalese girl, aged about 11, was admitted to the Infectious Diseases Hospital of Colombo in 1910 with the diagnosis of diphtheria There were white patches on the tonsils, iivila and soft palate The temperature was rather high (102° F), the pulse rate was fast and of low pressure There was some swelling at the angle of the jaw The child developed symptoms of bronchopneumonia and died three days after admission Antidiphtheria seriim was given twice by the physician in charge of

TONSILLOMYCOSES

the hospital The microscopic and bacteriologic examination of the patches for the Klebs-Löffler bacillus, carried out with the usual technique, serum media, etc., remained negative Bacteria were not seen in the specimens taken directly from the patches, but numerous mycelial and conidial elements of the fungus were present. On serum and glycerin agar media colonies of diphtheria or other bacteria were not produced. The fungus had all the biochemical characters of Monilia tropicalis Castellani.

Prognosis — The prognosis is generally favourable, but not always. In a case in Geylon the fungal infection spread to the bronchi and lungs, and a severe mycotic bronchopneumonia developed, which ended fatally

Diagnosis — This is based on the microscopical and cultural examination of the white patches, which will usually reveal a large number of fungal elements, generally in the form of yeast-like bodies The condition is to be differentiated from diphtheria by the presence of the fungus and absence of the diphtheria bacillus It must be kept in mind, however, that cases of mixed infection, diphtheria plus mycosis, are occasionally met with The condition must also be differentiated from Plaut-Vincent's angina, in mycosis, spirochaetes are absent or exceedingly rare, moreover, in Plaut-Vincent's angina if the white exudate, which in reality is usually of a dirty greyish colour rather than cream white, is removed, an ulcer will be seen, frequently rather deep, while usually in mycosis the removal of the mycotic membrane will show only very superficial lesions

Treatment—Diluted tincture of iodine should be applied to the patches, and a carbolic spray (1 per cent) may be used Chlorine gargles are useful. Potassium iodide may be given internally

SUBACUTE AND CHRONIC TONSILLOMYCOSES.

The principal types are .--

(1) Tonsilloactinomycosis.

- (2) Tonsillopseudoactmomycosis
- (3) Tonsillomycosis fusca
- (4) Tonsillomycosis spiculata vel spinulosa.

TONSILLOACTINOMYCOSIS

Etiology —The condition, which is rare, is caused by fungi of the genus Nocardia (Actinomyces, Discomyces, Streptothrii) and Cohnistreptothriv



1 10 7 — Nocadia X 750

Symptomatology —An abscess slowly forms in the tonsil and peritonsillar tissues; there may be pain and difficulty in swallowing, the condition is generally unilateral and the cervical glands of the same side may become enlarged After a time the abscess opens a point an eously through one or several

openings which discharge pus containing yellow or whitish-yellow grains. After bursting, the abscess continues to discharge indefinitely, the pus having the same appearance. There is no tendency to spontaneous cure, and the mycotic infection may spread to other parts.

Diagnosis—This is based on the microscopic and cultural examination of the grains, which will reveal presence of fungi of the type Nocardia (Actinomyces, Streptothria, Discomyces) or Cohnistreptothria

Prognosis — If the diagnosis is made at an early stage and the specific treatment carried out properly, the prognosis is good

Treatment —Potassium iodide given internally in 76

TONSILLOMYCOSES

large doses (grs. xxx to 31, tid.) is very efficacious.

TONSILLOPSEUDOACTINOMYCOSIS.

The symptoms are the same as in actinomycosis, but the pus does not contain grains and the condition is much less influenced by potassium iodide. The fungi belong to the genera Nocardia (Actinomyces) and Cohnistreptothrix

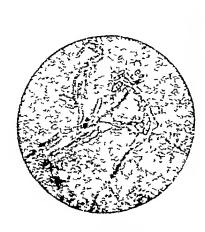
TONSILLOMYCOSIS FUSCA.

Synonyms — Tonsillohemisporosis, Tonsillotrichosporosis

Remarks.—This is a mycotic condition of the tonsils and surrounding tissues, usually running a subacute or chronic course, but occasionally acute. It was first described by me and called by me tonsillohemisporosis, as I believed that the causative filamentous fungi belonged to the genus Hemispora Ota has shown that most of these fungi belong in reality to the genus Trichosporum, a genus of filamentous fungi with elongated hypae and spores which in the lesions are at times embedded in a ground substance Until recently it was considered that all species of the genus Trichosporum lived on the hairs in man, but according to Ota some strains of the fungus described by me as Hemispora rugosa and found in tonsillomycosis are m reality fungi of the genus Trichosporum In certain cases the fungi seem to belong to the genus Oidium (sensu Pmov)

Symptomatology—The onset may be gradual or acute, the patient complains of sore throat and pain in swallowing. There may be fever. The general condition in most cases is not serious. Usually brownish-yellowish or greyish or greenish-brownish spots are seen in correspondence with the follicles; these spots may coalesce, forming a brownish or yellowish-

brownish or greyish membrane which is not easily removed. After a week or two the general symptoms disappear, but one or two patches will persist for



1:13 8—Hemispora rugosa, Castellani, 1910 (Hanging drop culture) X 750



Fig. 9—Hemispora rugosa, Castellani, 1910 (Glucoso agar oulture)

months, in one case of mine it did not disappear completely for more than a year. The same mycotic infection may invade the oral mucosa (brown or yellow thrush)

Diagnosis—This is based on the peculiar brownish or brownish-greyish or brownish-yellowish patches, which respond to treatment with difficulty. The microscopical examination of the patch will show presence of a fungus with abundant, fairly large mycelial threads, which will produce on glucose agar a cerebriform or crinkled growth of a brownish colour

Prognosis.—Good as regards life, but the patches take many months, sometimes years, to disappear.

Geographical—The condition has been found in Ceylon, India, South Africa, Italy and the Balkans

Treatment -Locally, diluted tincture of iodine, in-

TONSILLOMYCOSES

ternally potassium iodide. The treatment is generally very difficult

TONSILLOMYCOSIS SPINULOSA.

Synonyms — Tonsillomycosis spiculata Tonsillooidiomycosis pro parte

Etrology—The microscopical and cultural examination of the spicules shows that they consist of fungi, usually of the genus Ordrum (sensu Pinoy), and at times of the genera Trichosporum and Hemispora In several cases I have found Ordrum asteroides and Ordrum matalense

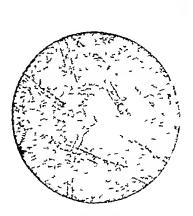


Fig 10 —Oldium matalense Castellam, 1915 Hanging-drop culture X 750



Fig 11 —Ordnum matalense, Castellani, 1915 Glucose agar culture

Symptomatology —On inspection of the tonsils numerous grey or greyish-brownish or whitish or white erect spicules, sometimes in bundles several millimetres in length are seen, usually originating in the crypts. The condition runs a very chronic course. The patient may complain of slight sore throat, but

the symptoms are seldom acute

Diagnosis.—This is based on the microscopical and cultural investigation of the spicules

Treatment—The treatment consists of applying locally diluted tincture of iodine, potassium iodide may be given internally

GRANULOMYCOSIS OF THE CRYPTS

The disease, which is not new, but is little known, runs a chronic course and is not painful It seems to be more common in the tropics than in the temperate zone. I saw several cases in Ceylon The patient often comes to consult the physician not because of a sore throat, but because of the unpleasant odour of the breath On the tonsils are seen small whitishyellowish spots which are in reality the surface portion of the granules contained in the crypts and which may be extracted with comparative ease These bodies when crushed emit an offensive odour, under the microscope they are seen to consist of masses of nocardia-like organisms, at other times of masses of leptothrix and vibriothrix; in certain cases, both nocardial fungi and leptothrix are seen as well as various bacteria, and even protozoa such as spirochaetes, amoebae and flagellates. The nocardia fungi present in the nodules have been thoroughly investigated by Davis in America and are grown with great difficulty From some cases I have isolated a bacillus giving a most offensive odour

RARER TONSILLOMYCOSES

Tonsillomycoses due to fungi of the genera Aspergillus, Penicillium, Mucor, and many other types of fungi have been described, but are very rare. The diagnosis is based on microscopical and cultural investigation.

It must be remembered that the tonsillar crypts of

TONSILLOMYCOSES

apparently healthy individuals may contain spores of fungi in addition to many other organisms; moniliæ are not infrequently present. It is also known that various protozoa may occasionally be found in that situation, amoebæ, spirochætes The tonsils are therefore a reservoir for many different organisms.

CONCLUSION

Diseases of the tonsils due to fungi may be classified m various ways, in this article I have adopted a clinical classification as probably the most useful for practitioners According to this classification, tonsillomycoses are separated into two groups, acute and chronic Of the acute tonsillomycoses the principal types are tonsillomycosis follicularis and tonsillomycosis membranacea (tonsillomycosis diphtheriasimilis) Cases of the latter type may resemble diphtheria very closely Of the chronic and subacute tonsillomycoses the principal types are tonsilloactinomycosis, tonsillopseudoactinomycosis, tonsillomycosis fusca and tonsillomycosis spiculata vel spinulosa

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The Surgical Anatomy of the Tonsil and its Bearing on Complete Tonsillectomy.

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YMPHOID tissue consists of a delicate network of connective tissue with lymphocytes in greater or lesser numbers within its meshes, they may be scattered diffusely through the network-diffuse lymphoid tissue, or packed in a circumscribed arealymphoid follicles When lymphoid tissue is developed in mucous membranes it occurs within the tunica propria or fibrous layer, and wherever lymphoid nodules or follicles of any considerable size are developed in a limited area the mucous membrane is invaginated in the form of pits or crypts, so that there is a comparatively large surface of mucous membrane in a small space The unit of these nodules of lymphoid tissue is the pit, and the size of a mass of lymphoid tissue depends on the number and size of the pits or folds of the mucous membrane Surrounding the entrance to the respiratory and alimentary passages is a chain of masses of lymphoid tissue and lymphatic vessels known as Waldeyer's ring (first described by Waldeyer in 1884), acting as a first line of defence against disease Waldeyer's ring includes the faucial tonsils, the lingual tonsil, the pharyngeal tonsil (commonly known as adenoids), the lateral band of lymphoid tissue behind each anterior pillar of the fauces, the lymphoid tissue of the cushions of the

Eustachian tubes, and the lymphoid nodules on the posterior pharyngeal wall. The small nodules on the posterior pharyngeal wall consist of but a single unit, with a tiny, shallow crypt, but some of the larger nodules may be composed of several lymphoid units. The faucial tonsils, on the other hand, are formed by the conjunction of a great number of lymphoid units in the sinus tonsillaris, and the crypts are large and extend deeply into the tissue of the tonsil. In the lingual tonsil the crypts are not deep, but in the pharyngeal tonsil there are extensive and complicated infoldings. All of the lymphoid tissue in Waldeyer's ring is liable to infection and enlargement, but those parts of it in which the crypts are insignificant have little or no importance in relation to systemic infection

The importance of infection of the faucial tonsils with reference to systemic disease is to-day generally recognized, as a result of the work on focal infections of William Hunter and his followers the diseases which have been attributed to infection of the faucial tonsils reads almost like the index of a textbook of medicine Tonsillectomy has been approved by competent authorities for the relief of the following conditions -Scalet fever, puerperal fever and diphtheria (carriers), influenza, poliomyelitis, cervical adenitis, toxic goitre, gastro-intestinal dyspepsia, gastric and duodenal ulcer, colitis, cholecystitis, appendicitis; acute rheumatism, neuritis, rheumatoid arthritis, fibrositis, myalgia, lumbago, recurrent sciatica, myocarditis, endocarditis, phlebitis, persistent conjunctivitis, corneal ulcer, iritis, iridocyclitis; persistent sinusitis, persistent otorrhœa after mastoid operation, middle-ear catarrh, otosclerosis. recurrent earache; acne, chronic eczema, furunculosis of the face and neck, erythema multiforme, chronic urticaria, alopecia areata; chorea, epilepsy, albuminuria, acute and chronic nephritis; anæmia, chronic

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toxemia, persistent rise of temperature

Such a lengthy list as this, which is by no means exhaustive, cannot add much to the regard with which wholesale tonsillectomy and tonsillectomists are held by many practitioners of medicine; but no self-respecting throat surgeon would consider it justifiable to remove tonsils for any of the above conditions until he had satisfied himself, after a thorough investigation of the patient in co-operation with a general physician, that there was no other more likely cause of the disease; even those diseases which may be accepted as due to a septic focus may just as likely be due to infection of the teeth, nasal sinuses, ears, intestinal or genito-urinary tracts

On one point, however, all authorities are nowadays agreed, and that is that if the disease is to be eradicated by tonsillectomy the tonsils must be removed completely It is the general recognition of this principle that has brought about in the last twenty years a revolution in the methods of operating upon the tonsils In complete tonsillectomy the lowermost limit of the tonsil must be enucleated in its so-called capsule along with the general mass of the tonsil, because if a stump of tonsil is left, however small it may be, lymphoid reproduction usually begins from it and a lymphoid mass develops which will give rise to all the disabilities and symptoms which required the operation It is not the size of the tonsil or mass of lymphoid tissue that matters, but its septicity, and this may prove to be of a high degree in a small tonsil

The faucial tonsil is not a lymph gland covered with a capsule, as it has frequently been described, but consists of a mass of lymphoid tissue embedded in a triangular fossa formed between the glossopalatine (anterior) and pharyngopalatine (posterior) pillars of the fauces and the side of the tongue. The tonsils are developed from the dorsal angles of the second

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TONSILLECTOMY

pharyngeal pouches, and the entoderm lining these pouches grows in the form of solid buds into the surrounding mesoderm These buds are hollowed out by the degeneration of their central cells and form the crypts of the tonsils Lymphoid cells accumulate round the crypts and group themselves to form the lymphoid follicles The faucial tonsil is therefore a somewhat tubular structure, with a hood-like upper lobe surrounding the so-called supratonsillar fossa (crypta magna or intratonsillar fossa), a central lymphoid mass, and a lower lobe A fold of mucous membrane arches backwards from the glossopala-tine pillar, and the upper part of this fold, the plica semilunaris, stretches between the two pillars, forming the medial wall of the supratonsillar fossa, the lower of this fold, the plica triangularis, forms the medial wall of the anterior and lower parts of the tonsil, which it overlaps. The plicas are, in fact, the margins of the tonsillar pouch, and a large part of the tonsil is therefore situated below the level of the surrounding mucous membrane Denis Browne has described a "suspensory ligament" connecting the anterior angle of the tonsil to the base of the tongue, where it blends with the muscle sheaths, this band of fibrous tissue is really a thickened part of the plica triangularis, and is sometimes of importance in the surgical removal of the tonsil The deep surface of the tonsil is separated from its muscular bed by some loose areolar tissue, which is easily split into layers, with spaces between containing mucous glands, small veins, and some fat cells. When the tonsil is removed the socalled capsule seen covering it after operation is in reality a layer of this connective tissue, which forms part of the sheath of the muscles of the tonsillar bed The capsule of the tonsil is, therefore, merely a surgical artefact

The prominence of the anterior pillar of the fauces

is formed by the palatoglossus muscle, which has a fan-like origin from the anterior surface of the soft palate, where it is continuous with the muscle of the opposite side and, passing downwards and forwards in front of the faucial tonsil, is inserted into the side of the tongue The superior constrictor muscle forms the circular musculature of the pharynx; it arises from the lower third of the internal pterygoid plate and the hamular process, the pterygo-mandibular raphe, the alveolar process of the mandible, and by a few fibres from the side of the tongue; its fibres curve backwards to be inserted into the median raphe, its upper fibres being prolonged by an aponeurosis upwards to the base of the skull The superior constrictor is in relation surface with the palatopharvngeus ın ıts mner muscle and the pharyngeal aponeurosis-it is usually described as being also in relation with the capsule of

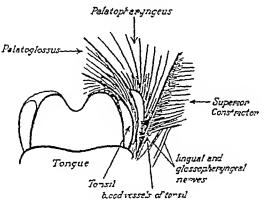


Fig. 1—Dissection of pharynx showing relations of tensil to muscles of pharynx (Fowler and Todd)

the tonsil, but careful dissection will show that this is not the case, the superior constrictor being separated from the tonsil by the palatopharyngeus. This muscle has a much more important relationship to the tonsil than is generally realized. It is attached above to the base of the skull, the Eustachian tube and the soft palate forms a muscular layer around the pharynx

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between the submucosa and the superior constrictor, and finally becomes merged with the upper part of the wall of the œsophagus Part of the palatopharyngeus muscle forms the posterior pillar of the fauces and defines the bed of the tonsil behind, in front it merges with the bucco-pharyngeal fascia. Certain fibres of the

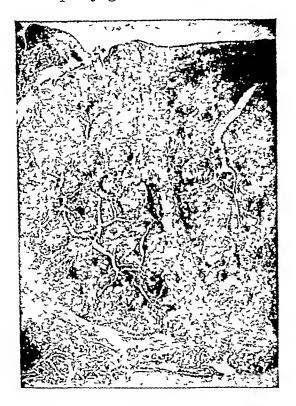
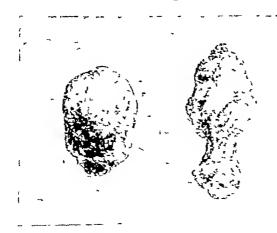


Fig 2 —Showing the tonsil elements blended with muscle fibres (Milligan)

palatopharyngeus are attached to the deep surface of the tonsil and, on dissection, some fibres are found actually to be imbedded in the substance of the tonsil, the tonsil elements being closely blended and mixed with muscle fibres, so that it is impossible to remove the tonsil without removing a certain portion of muscle fibre also Fowler and Wingate Todd have given

these fibres the name of the tonsillopharyngeus muscle, but, although it is true that these muscle fibres have a certain importance in retaining the tonsil in place, it seems hardly necessary to give them the dignity of the name of a distinct muscle

The importance of this muscular attachment lies in the part it plays in the surgical removal of the tonsil. In dissecting out a tonsil the surgeon finds it quite easy to strip the upper pole from its bed until, about two-thirds of the way down the tonsil, he encounters the muscular fibres which enter the tonsil from the palatopharyngeus. The usual procedure is then to arrange a snare round the tonsil and to trust to the action of the snare to remove the lower pole of the tonsil. If the muscular fibres are few and unimportant this procedure is quite successful, and the



tonsil is completely removed, as in A, Fig 3 But, on the other hand, if the muscular fibres are more abundant and there is a marked infratonsillar lobe of lymphoid tissue, as in B, Fig 3, the employment of a snare to complete the enucleation must inevitably leave a large

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piece of lymphoid tissue behind, the results of which have already been discussed The same holds good with regard to the employment of a guillotine for the enucleation of tonsils; it seems to us inevitable that the guillotine must sometimes leave pieces of tonsil behind, even in children, in spite of the well-recognized skill of such a surgeon as Greenfield Sluder, who claimed 99 6 per cent of completely successful results in tonsillectomy with a guillotine. When Whillis and Pybus revolutionized guillotine tonsillectomy by employing the reversed method, in their first series of 200 cases they made the modest claim that they were able to enucleate 42 per cent. of tonsils complete in their capsule in one piece, in a later series of 100 cases they were able to claim 74 per cent of cases enucleated complete in one piece Practice in this method has certainly increased the percentage of complete results in skilful hands, but we refuse to believe that the average operator with the guillotine achieves anything near 100 per cent of complete tonsillectomies

To remove a tonsil completely in 100 per cent of cases it seems to us necessary to employ the method of careful, methodical, slow, blunt dissection, which was outlined by G. E. Waugh in 1909 and has since been modified in various details by Herbert Tilley and other surgeons. By this method not only is it certain that every tonsil can be completely removed, but the operation can be made in most cases practically bloodless, the pillars of the fauces are not damaged, the pain after the operation is greatly lessened, and the period of convalescence is shortened. The disadvantages of this operation are that it is not easy, it takes longer than the guillotine operation, and it requires a longer and deeper anæsthesia, still, in our opinion, these disadvantages are greatly outweighed by the advantages

The patient is placed on his back with a sandbag

under the shoulders and the head is lowered and well extended on the neck; this brings the chin, middle line of the neck, and the sternum almost in a direct line, and the trachea therefore slopes downwards towards the post-nasal space, so that blood cannot get down it. The tongue is held forward with a tongue-clip, and the jaws are held apart with a Waugh's or Doyen's gag. The operator sits with a forehead light at the head of the table, and the anæsthetist stands on his left. With a pair of long

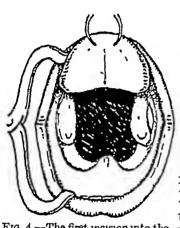


Fig 4—The first incision into the plica of the right tonsil, exposing the "capsule"

tenaculum forceps the plica is picked up about half-way down the outer border of the tonsil, internal to the anterior pillar of the fauces but not too close to the tonsil. With a pair of long, straight, sharp-pointed scissors (those I use are 8½ inches long, made for me by Messrs Mayer and Phelps), a cut is made into the mucous membrane which has been picked up, exposing the white "capsule" of the

tonsil; the cut is continued first upwards towards the tongue, then downwards towards the soft palate, and then continued upwards again, separating the posterior pillar of the fauces from the tonsil. The first incision is then slightly enlarged with long dissecting forceps, and a folded square of gauze is introduced and pushed gently downwards by the forceps between the tonsil and the anterior and posterior pillars, coaxing the tonsil out of its bed. The muscular attachment of the palatopharyngeus to the tonsil is gently teased through with the aid of the gauze swab or, if necessary, by the toothed dissecting forceps alone. The dissection must be continued onwards, following the

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lines of aponeurotic cleavage, until the whole lymphoid mass of the tonsil, together with its infratonsillar portion, is completely separated, going if necessary well down into the pharynx It is unnecessary, for the reasons stated in the opening paragraph, to remove any part of the true lingual tonsil, but the dissection of the faucial tonsil must be carried right up to, but not beyond, the edge of the tongue Bleeding points are picked up with the dissecting forceps and long artery forceps applied to them, when the bleeding is persistent the vessel (which is quite as frequently a vein as an artery) is tied off with hien thread, and the patient is not allowed to leave the operating table until all bleeding has ceased It will be obvious that in this complete operation there is no place for the snare or the guillotine

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Intrinsic Surgery of the Air and Food Passages.

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ESS than twenty-five years ago, surgery of the esophagus was limited to the operation of lateral esophagotomy, and surgery of the bronchi did not exist. To-day the highly developed intrinsic surgery of the air and food passages enables us to make a leisurely and thorough inspection of their lining and contents, so that growths can be identified, clipped for diagnostic section and treated by radium, strictures dilated, abscesses evacuated, and foreign bodies removed from their lumen with a hitherto impossible speed and accuracy.

It is due to the pioneers who have perfected the art of œsophagoscopy and bronchoscopy that the beauty of their work should be proclaimed, it is not well that mistrust based on prejudice should in any way stand between patients and the hope of cure which the brilliant work of men like Chevalier Jackson, Killian and Mosher has made possible For a certain amount of this mistrust it is not altogether difficult to account The days of experimental effort are yet recent, and on many a student early failures have made a deep impression only with difficulty removed, moreover, even nowadays, when experiment has been translated into established practice. it must be confessed that many are bringing discredit on the work because they attempt it with makeshift instruments, with less than adequate training and with less than their share of instinctive manipu-The advancement of an ideal must have such impediments; it was ever thus, and the

fact must be accepted without bitterness

Much well-directed criticism has lately been aimed at the tendency to excessive specialization, and there is no doubt whatever that in the average illness a patient wholly guided by specialist advice is running more risk than he suspects, but in a case, say, of esophageal or bronchial foreign body, involving, as it does, intricate mechanical problems, the situation is different; here the endoscopist is a mechanic who in no way competes with the native judgment and understanding of the clinician; the latter must therefore find no arrogance in the remarks which ensue when emphasis is laid on the endoscopist's right not only to solve his problems unaided, but to have cases referred to him without delay and without previous interference

MALIGNANT DISEASE OF THE ŒSOPHAGUS

The most common condition of general practice calling for the co-operation of the endoscopist is the dysphagia of gradual onset in a patient past middle life Before the value of radium therapy was realized there was no great incentive to the early diagnosis of cancer in a position beyond the reach of surgery The common and not surprising attitude was: "Why trouble the patient with an examination which will probably only antedate his death sentence; let us temporize till gastrostomy is called for " From one point of view that attitude was reasonable enough; but it did not take into account the fact that certain cases of dysphagia can with certainty be proved to be non-malignant by œsophagoscopy In such a case the patient can be spared much mental anguish, whereas without visual evidence one can only give an opinion so little removed from a guess that it is convincing neither to the patient nor to oneself.

But if before radium came to our aid there was

good reason for early œsophagoscopic diagnosis, the need is increased now that we have a potential cure At the least symptom of difficulty of swallowingand an observant patient will notice a slight hesitation or unusual sensation on swallowing long before his symptom can be called "dysphagia"—esophagoscopy is now an urgent matter, if negative, the patient will be relieved in mind, if positive and the stricture is not too advanced, the possibility of cure is not altogether remote There are difficulties enough m the accurate application of radium even to a small esophageal growth, the writer finds after a good deal of experimenting that a moderate dose, say, 10 one-milligramme radium needles inserted into the stricture by means of a gum-elastic catheter which is left in place about four or five days, has given a good result in certain cases. But when, through delay in seeking advice, the patient presents a long and tortuous, hard stricture through which even the finest bouge cannot be guided, the difficulties of radium application are too often insuperable The mortality of esophageal cancer is still practically 100 per cent. If there is to be success with radium therapy, cases must be submitted to examination at a very early stage, perhaps twenty cases of trivial disorder in swallowing may be esophagoscoped for every actual case of cancer discovered, but that case, in the writer's opinion, will probably be curable, for it will be at an early stage The distressingly misdirected optimism of the average patient is the great stumbling block in the way of progress, most patients are content to hope for the best throughout long periods of awkwardness in swallowing; and only when inability to swallow liquids is added to the difficulty with solids will their unreasonable peace give way to panic, then they are incurable The fire rages; a well-equipped fire-engine is available

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but not called, since those who are in danger sleep; and many surgeons despondent about the cure of esophageal cancer are really only despondent because of the sleepmess of the public.

In early visual examination lies our only hope of curing cancer of the gullet, inferential diagnosis from symptoms must surely be abandoned, for it is no on the other hand, is Surgery, and radium therapy its In the hands of those triumphant justification competent to perform it, esophagoscopy takes no more than two or three minutes, and it is as entirely free from risk as the passage of a urethral catheter, the procedure can be carried out without general anæsthesia, but the writer has a decided preference for a general anæsthetic, not merely because the resulting relaxation is so helpful in manipulation, but because it is unwise to alarm patients with formidablelooking instruments however safe and painless their careful use may be

THE FOREIGN BODY IN THE ŒSOPHAGUS

A few clear-cut ideas on the subject of esophageal foreign body are very desirable, since at any moment a more or less panic-stricken patient may present himself for relief. Assuming that there is no interference with the air-way, there is much to be gained by a calm discussion of the circumstances of the accident; one arrives then at an estimate of the shape and sharpness of the foreign body, the degree of dysphagia caused by it, the supposed site of its impaction and the amount of pain to which it is giving rise. The impaction of a foreign body in the gullet gives rise to a very unmistakable sensation; it is not wise to ignore the patient's convictions on the matter;

even the most wretchedly introspective and fussy patient may actually have a bone stuck in the œsophagus, and one must not be too free with comforting assurances that he or she is merely feeling the scratch made by the bone. Nothing is gained by digital examination; but much may be risked, for a foreign body balanced on the edge of the larynx may be converted into a tragic emergency by digital examina-True, most foreign bodies become impacted at a lower level, they almost all lodge where they would be expected to lodge, namely, at the thoracic inlet narrowing situated at the level of the 7th dorsal and 1st cervical vertebræ This "bottle neck" to the œsophagus is beyond digital examination, and even were it otherwise, something more subtle than digital manipulation is necessary to dislodge an impacted foreign body

Therefore, while the laryngeal mirror will give much more safely the necessary information as to a foreign

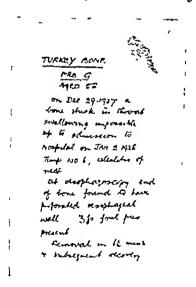


Fig 1 —Illustrates the risk of delay in removing a sharp bone from the esophagus

body in the pharynx, for the œsophagus itself it is of little use except that a pool of saliva in the pyriform fossæ is suggestive of a high œsophageal obstruc-When, therefore, a patient is believed to an œsophageal foreign body impacted at the thoracic inlet (subcricoid level), inspection of the hypo-pharynx is desirable and digital examination is risky and unhelpful, the patient is $_{
m then}$ asked to eat a

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small piece of bread and butter and the degree of pain and dysphagia is observed; radiography is the next obvious step in diagnosis (even in the case of non-opaque objects such as fish and small-game bones where the hesitation of a bismuth capsule viewed on the screen is a valuable hint). Conclusive diagnosis and removal is carried out by means of the esophagoscope, and no foreign body should be left over night in an esophagus. If neglected, the sharp object will more than probably perforate the very thin gullet wall, giving rise to an inevitably fatal mediastinitis or perforating the aorta, to which the esophagus is in perilous proximity. Even though not sharp, the foreign body needs removal without delay, for such objects as coins or toys, besides preventing the swallowing of food, quickly erode the esophageal wall, and, if left long enough, cause ulceration into the trachea or mediastinum

Very damnable indeed are probangs, bougies and com-catchers, accidentally they may be successful, but surgical success must not be accidental when it can be assured; and assured it is when the œsophagoscope is used by an experienced and well-trained operator who receives a case early, without previous inter-There may be occasions in our life for ference blind force, but the presence of a coin or upwardpointing bone or safety-pin embedded in sloughs in the almost perforated esophageal wall, with the aorta thumping away at less than a quarter-inch distance, must surely give pause to those who think they are faced with such an occasion Moreover, if blind methods fail, is it sportsmanship to hand on a damaged cesophagus to the surgeon, who, whatever his private bitterness of heart may be in the event of a fatal issue, must yet remain loyal to his colleague and share his responsibility?

The present occasion does not call for a detailed

description of œsophagoscopy; Professor Chevalier Jackson's work, "Œsophagoscopy and Broncho-



Fig 2—Illustrates the need for careful disentanglement of projecting points from esophageal folds as opposed to forcible and blind removal by probang

J B, ago 27 Feb ruary 5th, 1928 Half an upper denture impacted in esophagus during sleep (4 a.m.) Impossible to swallow solids or liquids, great pain on attempt being made At 12 30 p.m. of the same day, under ohloroform, esophagoscope passed and denture removed from post cricoid region Time, 40 seconds

scopy," contains a brilliant description of the technique, and should be read by all interested, an outline of the procedure may, however, be given After five hours without food or water, the patient receives a hypodermic of atropine, one half-hour later he is anæsthetized (general anæsthesia is rarely used in Professor Jackson's clinic and from personal observation the writer felt that the patients experienced no exceptional discomfort)

An assistant supports the patient's head and shoulders, the neck raised and the head extended to bring the pharynx into alignment with the thoracic esophagus, the operator passes a rigid, distally-lighted tube along the side of the tongue into the pyriform fossa, identifying as he proceeds the uvula, epiglottis and arytenoids, thence the tube is gently

pressed into the esophagus by overcoming the resistance of the crico-pharyngeus muscle beneath which most commonly lies the foreign body. So large and powerful is this muscle that it very often conceals the foreign body and those unacquainted with this feature have had many tragedies through over-riding the unseen foreign body with consequent damage to the esophageal wall. A few inches lower, the aortic pulsation is visible in the wall of the esophagus which at this point is widely open, ballooning out with respiration. Towards the crura of the diaphragm where the esophagus turns somewhat forward and to

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the left, another narrowing occurs, two mehes lower the esophagus enters the stomach, smooth walls giving place to corrugated. The thoroughly trained endoscopist can, under visual guidance, carry out the most subtle manipulations for disimpaction of a foreign body, with over a 99 per cent expectation of success.

FOREIGN BODY IN THE AIR PASSAGE

There is infinite variety in the kind of foreign body inhaled into the lung, within the last three years the writer has had occasion to remove two safety-pins, one shawl-pin, and a swab; and assisted at an unsuccessful attempt to recover a cherry-stone. Among other objects liable to be inhaled are food (especially in whooping-cough, thus accounting for much subsequent bronchiectasis and ill-health), teeth, pea-nuts, pins, nails, dental fillings, and, rarely, coms Indeed, any object held in the mouth at the moment of a jolt, sudden laughter or gasping inspiration may pass into the larynx and trachea Prophylaxis is obvious enough, objects should not unnecessarily be held in the mouth In regard to the question of teeth passing into the air passage, it is perfectly amazing, when we consider that this event is the dentist's only real opportunity of killing his patient, that definite and infallible precautions are not adopted which make it impossible to happen

Very broadly speaking, the esophageal conditions of urgency are reversed in the case of the air passage. Here the sharp objects are less urgent than the massive ones; whereas in the esophagus the sharp object is most perilous. Size and shape of a foreign body inhaled into the air passage determine its urgency, if large, death from suffocation may result in a few minutes, if sharp and thin, there may be scarcely a symptom for days or weeks. There is

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into the lung, an X-ray should be taken 1

The organic foreign bodies such as nuts and seeds are in a class by themselves, they set up an intense inflammation, and, if not removed by bronchoscopy are almost always fatal in young children. Therefore, any case presenting the superficial aspect of a pneumonia calls for strict inquiry as to the possibility of organic foreign body inhalation. In complete obstruction, air absorption below the obstruction causes at electasis. In partial obstruction an "obstructive emphysema" occurs through a valve action—the X-ray shows a relatively transparent affected lung, with flattened diaphragm and the heart moved over to the unaffected side at the end of expiration. The physical signs alone distinguish partial or complete foreign body obstruction from the consolidation of a pneumonia, but where any suspicion of a foreign body exists, opaque or otherwise, radiography is of immense assistance.

Whenever a bronchial foreign body has been diagnosed the only treatment called for is bronchoscopic removal without delay, however well or ill the patient. If the patient is well, an unremoved foreign body will one day most probably prove fatal; if the patient be dangerously ill, even at the point of death, bronchoscopic removal instantly commences his recovery. A moribund child from whose bronchus the writer removed an impacted swab, though it had been there thirty-six hours before bronchoscopy was appealed to, recovered health in a very few days. When confronted with a case of foreign body in

When confronted with a case of foreign body in the air passage, an instant decision as to the degree of urgency must be made

Is it urgent as regards Seconds, Hours, or Days?

(1) Urgent as regards Seconds—That is to say, a gasping, black, moribund patient who has a foreign body obstructing the larynx. Turn patient upside-

thus the widest range of reaction. It is sometimes maintained that a certain foreign body could not

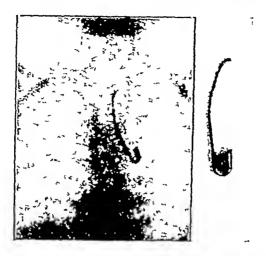


Fig. 3—Illustrates symptomless interval of a non obstructive metallic bronchial foreign body, and the comparative ease of removal even at so young an age

Success in this case was largely due to the vigilance of the medical man first consulted, who did not delay till secondary changes complicated the

situation

Peter C, aged 219 May 18th, 1924 Inhaled part of safety pin Very slight momentary cough, then no symptoms, but the mother being uneasy consulted her doctor, who, in spite of the absence of symptoms, took a serious view of the case

Admitted to Children's Hospital on May 24th X ray showed part of safety pin in the right main bronchus Under chloroform, a bronchoscope was passed along the trachea and after four minutes manipulation to release the impaction of the safety catch, the foreign body was recovered

possibly be in the lung because in such a case alarming symptoms would have been manifest at the time of inspiration; but such a comment is only just when the foreign body is obstructive in character. A non-obstructive foreign body, such as a pin, may pass through the larynx and lodge in a bronchus with nothing more than a trivial cough during inhalation, it may remain in the bronchus for days or weeks without giving the slightest symptom. This symptomless interval is of high importance, just at the stage when removal presents no difficulty, symptoms least call for interference. Hence, on the slightest suspicion of the inhalation of a foreign body

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down, thump back, digitally examine larynx, instant tracheotomy if unavailing But these cases seldom live long enough to reach the doctor

- (2) Urgent as regards Hours—That is to say, some air is entering, though patient may be seriously embarrassed. Under no circumstances must digital examination or change of posture be employed, a partially obstructing foreign body may thereby only be moved into a completely obstructing position, and the case transferred to the previous category. The indications are to prepare for tracheotomy and, without leaving the patient, send at once for a laryngologist who will remove the foreign body by laryngoscopy or bronchoscopy.
- (3) Urgent as regards Days—That is to say, a definite suspicion of foreign body is entertained, whether or not there are symptoms Radiography and bronchoscopy are the two very clear indications

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Fig. 4—Illustrates complications resulting from dolay in removal of an obstructive brenchial foreign

body (pencil cap)

Had the foreign body been romoved on the day of impaction (11 years previously) the operation might have lasted two to five minutes and the boy would have left hospital the next day Actually, he developed bronchiectasis which kept him from work for two or three years, followed by empyema for which he had rib resection Branchoscopy was thrice performed without recovering the foreign body, external operation twice Finally, at bronchoscopy, as the foreign body was tightly fixed in a stricture and could not be drawn upwards, it was displaced downwards to the surface of the lung and removed by Mr J R Griffith by external operation, the patient making an excellent recovery



is not so profound, the pyrexia not so high, and the congestion of the tympanic membrane not so diffuse, being usually limited to the periphery and along the malleus handle with, perhaps, a more diffuse congestion in its upper sector—Shrapnell's membrane. From the point of view of treatment, therefore, both types may be considered as one

TREATMENT.

Nasopharyngeal infections following the common cold, influenza or one of the exanthemata, more especially measles or scarlatina, are responsible for the majority of middle ear inflammations. It is a spread of infection along the Eustachian tube. Too commonly treatment directed to this source is overlooked, preventing complete resolution in a case otherwise soundly treated. Treatment must, therefore, be directed to (1) the source of infection, and (2) the aural inflammation

The Source of Infection — The nasopharyngeal infection can best be treated by steam inhalation medicated with menthol, or menthol with iodine or oil of eucalyptus. A pint of hot water at a temperature of 140° F is placed in a jug and a few crystals of menthol added. The patient is instructed to inhale alternatively through the mouth and through the nose, exhaling through the nose and mouth respectively with the head over the jug and a towel over the head. The following is particularly useful in pyogenic infections or when a more antiseptic inhalation is required —

R.							
Mentholis	•	-	-	-	-	- grs	5
Tinct 10di	-	-	-	-	-	-)	პ ૄ 88
Acetic ether		-	-		-	a.a	25 88

Sig One teaspoonful to a pint of hot water

Nasal douching and violent nose blowing should

The Treatment of Acute Otitis Media.

BY F HOLT DIGGLE, OBE, FRCS

Honorary Surgeon in charge of Ear, Nose and Throat Department, Ancoats Hospital, Manchester, Honorary Surgeon, Manchester Ear Hospital

HRONIC suppurative otitis media, with its permanent deafness and contingent intracranial and labyrinthine complications, is still largely responsible for the bulk of patients seeking treatment at any aural clinic The radical mastoid operation frequently necessary for its relicf, with its lengthy and tedious after-care and, in some few cases, the uncertainty as to complete cessation of suppuration, is merely an expression of failure in the treatment of its acute phase-acute otitis media With the exception of tuberculous and cholesteatomatous disease, chronic suppuration in the temporal bone invariably begins as an acute invasion, and it is only by a more thorough and energetic treatment of this stage can we hope to eliminate one of the commonest causes of permanent deafness.

PATHOLOGY.

Acute inflammation of the middle ear may be catarrhal or suppurative, and the latter may be suppurative from the outset or have a catarrhal stage. The exact recognition of the type of inflammation is, so far as the principles of treatment are concerned, a matter of little importance, except in so far as the more acute fulninating suppurative cases may demand earlier and more extensive surgical treatment. Suffice it to say that in the catarrhal stage the deafness

ACUTE OTITIS MEDIA

of discharge I venture even to suggest that if the ears were thus prepared at the outset of those exanthemata hable to acute otitis media as a complication the results would be much better. The public further need education in the avoidance of such remedies as olive oil for the relief of otalgia.

- (2) Relief of Pain.—The pain of middle ear inflammation is mainly one of tension due to the pressure of an inflammatory exudate in a small confined bony space, though to a lesser degree stimulation of the nerve endings in an inflamed mucosa may contribute As, therefore, the fluid increases so does the pain, particularly if the structure of the membrane is such as to resist bulging or spontaneous perforation. The application of anodyne drugs to the intact cutaneous surface of the tympanic membrane is always a matter of uncertainty. Yet in the early stages a few drops of 2 per cent carbolic acid in glycerine, or perhaps better still, menthol and carbolic 1 per cent. of each in glycerine, does certainly give some relief Drops containing cocaine or opium and its derivatives have httle effect Dry heat applied to the ear, as by a lightly filled hot-water bottle or a hot bran bag, is comforting Too much time, however, should not be wasted in attempting to relieve pain by means other than the provision of free drainage to the middle ear exudate
- (3) Drainage of the Middle Ear.—The early and free drainage secured by an incision of the membrane—a paracentesis tympani—affords in almost every instance prompt relief to pain and undoubtedly greatly assists towards early and complete resolution of the middle ear inflammation. But admittedly, many "acute ears" whose membranes are allowed to perforate spontaneously, ultimately make a perfect recovery. The size, situation and incidence in the course of the disease of such spontaneous perforations are

be avoided, as both are liable to disseminate infection along the Eustachian tube. The nasal passages may be emptied by blowing gently down the unoccluded nostrils at frequent intervals. On no account should the nostrils be compressed with the fingers over a handkerchief as is the common practice. Should the nasal secretion be particularly profuse it may be allowed to drip from the nose—the anterior nares being protected with a little pure vaseline or a strip of gauze laid across the nostrils and secured by strapping at the sides

Treatment with inhalations may be supplemented or, especially in infants and young children, replaced by instillations per the anterior nares of a few drops of collosol iodine or argentum or of 2-5 per cent protargol twice daily. Instillations of resorcin, grains three to an ounce of olive oil, are particularly useful in the subacute catarrhal nasopharyngeal infections in infants.

Treatment of the middle ear inflammation involves (1) the establishment of surgical cleanliness, (2) the relief of pain, and (3) the provision of drainage

(1) Surgical Cleanliness—So soon as a patient complains of earache the external canal should be inspected. Ceruminous and epithelial debris should be removed, and the skin of the external canal sterilised either by syringing gently with a mild antiseptic, such as carbolic lotion (1 in 60), or by the instillation of a few drops daily of 2 per cent carbolic acid in glycerine. Unless the external canal be thus prepared, there is a real risk of secondary infection should the tympanic membrane rupture spontaneously. Acute office media is primarily due to the invasion by a single organism whether this be streptococcus, the pneumococcus or the influenza bacillus, and any secondary infection of the middle ear exudate undoubtedly tends towards chronicity

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the catarrhal stage The repeated use of ear drops, constant mopping of the external canal and especially frequent syringing tend to produce secondary infections Irritative swelling of the canal may thus be induced, hindering drainage, whilst forceful syringing may drive infection into the mastoid antrum

A narrow wick of sterile gauze should be gently and lightly placed down the canal to the site of the incision and changed twice or thrice a day according to the amount of discharge. The less it is disturbed the better. A sterile pad of gauze and wool should be applied over the auricle which has previously been cleansed with spirit or ether. How frequently one sees a discharging ear treated with an absolute disregard for general surgical cleanliness? Many cases, particularly if catarrhal, make a perfect recovery under this treatment alone.

Should the discharge, however, be particularly profuse, purulent or thick, a few drops of hydrogen peroxide (vols 10) may be instilled and allowed to remain for two or three minutes, the canal then gently dried with pledgets of cotton wool and the gauze wick drain reapplied Syringing should be avoided, as infection may thus be disseminated along the middle ear cleft. If, however, for domestic or other reasons syringing must be employed, it is better to use saline or boracic solutions, as strong antiseptics tend to produce irritation with swelling of the canal. No force should be used, and it is particularly important to ensure that there is provision for free escape of the washings from the canal. Many syringes on the market possess a large bulbous extremity which almost entirely occludes the meatus.

Spirit drops are contraindicated during the acute stage, as they only cause great pain and may produce irritation of the canal. As, however, the discharge, towards the 7-10th day in an uncomplicated case,

determining factors Not infrequently the perforation is either too small or ill-placed to afford free middle ear dramage and in many, owing to the structural density of the membrane, occurs too late to prevent serious infection of the mastoid process. A permanent perforation is, moleover, not an uncommon result

Indications for Paracentesis Tympani —The severity of the earache, the degree of bulging and congestion of the tympanic membrane or the madequacy of a spontaneous perforation should be our criteria for performing a paracentesis Pain not relieved by inhalations or anodyne drops in 24 hours, particularly if increasing in severity or associated with rising pyrexia with or without a bulging membrane, is an indication for immediate incision Bulging of the tympanic membrane, usually in its posterior segment, calls for immediate incision I would stress the importance of this even in the absence of severe pain or much, if any, pyrexia Bulging denotes, of course, a large collection of fluid in the middle ear. This exudate, m the early stages catarrhal fluid, may ultimately resolve either by absorption or natural dramage along the Eustachian tube Resolution, however, may not be complete A residium of fluid remains which, gravitating to the floor of the middle ear, produces in time increasing deafness and timitus from cicatrization This, in my opinion, accounts for one of the causes of those intractable cases of deafness, namely, chronic catarrhal and adhesive otitis media The inadequacy of a spontaneous perforation may be judged by the persistence of pain or pyrexia in spite of otorrhea and otoscopically as a small perforation situated on the summit of a mipple-shaped projection of the membrane, denoting, as it does, middle ear pressure

Treatment of Middle Ear Discharge — Much harm

can result from too zealous after-care, especially in

ACUTE OTITIS MEDIA

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diminishes and becomes more watery or mucoid in consistency, and particularly if granulations are seen to be present around the incision, then a few warmed drops of the following.—

may be instilled daily and allowed to soak for ten

Persistence of Otorrhea -In an uncomplicated case the otorrhœa given such treatment gradually diminishes until by the second to third week, if not before, the middle is dry In some, however, this happy result does not obtain, the discharge persists or even The cause for this should be sought for in the nose and naso-pharynx, the tympanic membrane and the mastoid antrum A mass of infected adenoids, or occasionally, especially in children, an enlarged edematous posterior end of an inferior turbinate bone, or an unsuspected nasal sinus infection may be responsible The discharge is in such cases usually mucoid or more muco-pus than frankly purulent, and the perforation, if such has been spontaneous, is usually placed anteriorly. Each requires its appropriate treatment, but it is particularly at this stage that I would advocate the removal of adenoids. I am aware that many would remove the adenoids when the paracentesis is performed In fact, such was at one time my practice A few cases, however, of serious infection of the previously healthy ear with aggravated nasopharyngeal sepsis altered my procedure I now prefer to treat the naso-pharynx conservatively as detailed above and to remove the adenoids during the subacute or quiet stage should the discharge persist or at a later date if the ear be drv

The incision in the membrane not infrequently

ACUTE OTITIS MEDIA

tends to heal before complete cessation of discharge or may be blocked with a tuft of granulation tissue A second paracentesis tympam or the application of chromic acid to the granulations with the daily use of spirit drops (50 to 100 per cent.) is required to promote perfect drainage

Finally, the source of continued otorrhea may be and usually is due to infection of the mastoid antrum. How can such an infection be recognized? To await the classical textbook description of mastoid infection, namely mastoid pain, tenderness and swelling with displacement of the auricle is a mistake. Valuable time can thus be lost in securing early cessation of discharge. The longer suppuration is allowed to persist the greater are the risks of some degree of permanent deafness or tinnitus due to post-suppurative cicatricial changes either with or without a permanent perforation.

Mastoid swelling merely denotes a spread of infection to the superficial periosteum—a periosteitis—and may or may not arise according to the anatomical structure of the mastoid process. In the cellular type of mastoid such swelling fortunately occurs early in the course of the disease necessitating immediate antral drainage with gratifying results. Not so, however, in the more sclerotic or acellular type—mastoid swelling and tenderness may be long delayed and even never occur—otorrheea persisting the while.

mastoid swelling and tenderness may be long delayed and even never occur—otorrhea persisting the while. Other more reliable early signs are otoscopic and perhaps require more specialised training. Such evidences are to be found in a sagging of the posterior meatal wall and adjacent portion of the tympanic membrane. A profuse purulent discharge filling the meatus and rapidly reappearing as fast as the external canal is cleaned is, however, almost invariably indicative of antral infection.

Pain and tenderness over the mastoid are valuable

THE PRACTITI

signs but need not necessarily mastoid pain and tenderness will present at the onset of the otitic in middle ear drainage is established in fused with gross infection of the me symptoms usually subside with drainage

Drainage of the Mastoid Antra infection of the mastoid antrum is rethe cause of persistent otorrhea it immediately by the simple conservoperation. It is an operation pracrisks to those accustomed to aural productive of so much good as it complete cessation of discharge it of hearing as not to be neglected.

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The Prevention and Treatment of Suppurative Otitis Media

By W J HARRISON, M.B, BS, MRCS
Surgeon to the Ear, Nose and Throat Hospital, Newcastle-on-Tyne,
Aural Surgeon, Ministry of Pensions Hospital, Newcastle on-Tyne

Chronic, are conditions which every practitioner is constantly called upon to treat. Large numbers of preventable cases occur, because the public treat the disease lightly and do not recognize that. (1) life may be endangered by mastoid disease with intralabyrinthine or intra-cranial complications, (2) deafness, with consequent impairment of the patient's usefulness and happiness frequently follows an attack, even though it has been carefully treated, (3) impairment of the general health may result from the absorption of toxins in chronic cases

Most cases of suppuration of the middle ear occur in childhood. The Eustachian tube is relatively wider and shorter in children than in adults and lies more nearly in a horizontal plane, so allowing the tympanum to be more readily infected. Naso-pharyngitis—the commonest cause—is most often brought about by the presence of infected tonsils and adenoids. Colds and infectious diseases with throat and nose symptoms are much commoner at that period than later in life.

Nasal sinus disease occurs more frequently in later life, but more children have this complaint than was thought to be the case a few years ago, and this condition may cause ear suppuration. A few cases are caused by syringing the ear after rupture of the membrane caused by the introduction of a foreign body, a blow on the ear or a fall. In such cases the

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signs but need not necessarily be present Early mastoid pain and tenderness which is frequently present at the onset of the otitic inflammation before middle ear drainage is established should not be confused with gross infection of the mastoid. Such early symptoms usually subside with free middle ear drainage

Drainage of the Mastord Antrum—As soon as infection of the mastord antrum is recognized as being the cause of persistent otorrhea, it should be drained immediately by the simple conservative (Schwartze) operation. It is an operation practically devoid of risks to those accustomed to aural surgery and one productive of so much good as regards early and complete cessation of discharge with preservation of hearing as not to be neglected.

If antral suppuration be allowed to persist it may after a tedious illness ultimately recover either with or without a permanent perforation but almost certainly with some degree of ensuing deafness and tinnitus. Then again, the otorrhea may become so slight as to be unrecognizable to the patient. How frequently we see patients complaining of deafness whose ears are found to be discharging yet on close interrogation they are completely unaware of its existence.

In conclusion, I would stress the importance of (1) An early paracentesis tympani; (2) the avoidance of secondary infections, (3) searching for and treating early the causes for persistent otorrhæa, and (4) the value of early antral drainage if we are to avoid one of the commonest causes of permanent deafness, namely, chronic suppurative otitis media

SUPPURATIVE OTITIS MEDIA

these conditions and colds, influenzal or otherwise, cause very many cases of acute middle ear disease

During all febrile diseases, and particularly in the course of those with throat and nose symptoms, careful attention should be paid to the cleansing of these regions, by doing so many cases of ear infection will be prevented, and the patient's discomfort greatly relieved The teeth should be brushed after meals and a mouth wash used several times a day. Listerine, glycothymoline, hydrogen peroxide mouth washes are useful: phenate of soda cannot be used for children as it is poisonous if swallowed, but it is an excellent mouth wash for older patients For the sore throat gargles are generally useless Few adults, and still fewer children get the fluid to the right spot, and gargling is a distinctly painful procedure when the inflammation is at all severe. The throat may be sprayed, swabbed, or syringed If a spray is used it should be coarse and the De Vilbus spray (No 16) is as good as any The fluid should be as warm as can be borne comfortably, and applied several times a day Swabs should be made of cotton wool and should not be too dry when used When a syringe is used the head is bent well forward, the nozzle of a 4-oz rubber syringe, or a Higginson syringe, introduced behind the teeth, and the throat gently syringed Too much force must not be used, and the flow stopped if gagging occurs

In the mild catarrhal conditions spraying is usually all that is required. Pot chlor and borax (of each gr. x to zi), listerine or glycothymoline may be used. Alkaline sprays liquify and wash away the mucus. More severe cases benefit by being, from time to time, painted with glycerinum acidi tannici, 5 per cent, glycerinum acidi carbolici, 5 per cent. menthol and guaiacol in almond oil, silver nitrate 15 to 90 grs. adzī, or sprayed with menthol. The rule with silver

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most that should be done is thoroughly to disinfect the external auditary canal with spirit on cotton wool mops, dry the canal and blow a small quantity of boric acid or dimol, or some other non-irritating antiseptic powder, over the membrane and deeper part of the canal, and close it with a pledget of cotton wool in the meatus. Syringing will drive any septic material into the middle ear, and suppuration will almost inevitably follow. In the extraction of foreign bodies when the membrane is intact great care is needed. Unless they can be syringed out, extraction should always be done under direct vision.

If the throat and nose of every child brought for treatment of any description were examined as a routine procedure, and operated on when necessary, the number of cases of suppurative otitis media would be greatly reduced. A small pad of adenoids can do as much harm as a large one, particularly if it is septic When adenoids encroach on the space behind the Eustachian tube (Rosenmuller's fossa) they interfere with its movements, cause congestion and predispose to infection Large tonsils have a similar action by pushing back the posterior pillow and interfering with the proper opening of the Eustachian tube Small, septic tonsils can cause mischief as readily as enlarged tonsils. Many children have adenoids without showing the typical signs as described in textbooks. Any weakly child, or one who suffers from a morning cough or "tickling" cough, or frequent colds, should have its throat and nose examined for disease or obstruction Attacks of earache, a condition which some parents seem to consider natural in childhood. are an indication for a careful examination of the throat and nose

Diseased tonsils predispose to diphtheria and are now considered by many to be the main channels of infection in scarlet fever and possibly in measles;

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so Even if the discharge be purulent from the beginning, the inflammation may be made more severe by additional infection from the canal

The classical symptoms of acute middle ear inflammation are pain, fever, deafness, and tinnitus. In the acute infectious diseases, particularly scarlet fever and measles, pain is often not complained of even by Even in uncomplicated cases young older children children may not complain of pain in the ear is always more marked in children than in adults, but when fever is present already, the onset of ear mischief may not cause an increase of temperature, or only a slight one which is easily overlooked Deafness and tunnitus are well marked in adults but not so easy to elucidate in children Catching hold of an ear, or rubbing it when asleep or awake, are strongly suggestive of ear mischief in a child Tenderness in front of the ear should always arouse suspicion, but restlessness, sleeplessness, peevishness, or crying out at night may be the only indication of ear trouble till the discharge appears In very young children the head is sometimes retracted and held in the position, assumed in meningitis

In early cases the drum will be seen to be reddened, particularly in its upper part; later, the whole drum may become deeply inflamed, and the outline of the malleus blurred and finally lost. Bulging occurs, and just before rupture a whitish or yellowish area may show. When seen in an early stage an attempt should be made to check the disease. If going about, the patient must be confined to bed, given a dose of caloniel and a saline laxative in the morning following, or other purgative, and put on a fluid diet for 24 to 48 hours. Lying with the ear against a hot atter bottle, covered with flannel to prevent burning, not only relieves pain but helps to check the inflammation. Drops of glycerin of carbolic acid, 2½ per cent,

solutions in tonsillar inflammations is . the severer the inflammation, the stronger the solution

In diphtheria the membrane can be dissolved and washed away with an alkaline lotion, and a very useful one is pot chlor, sodii blearb, sodii chlor, of each gr. x, ad z_1 .

In the membranous and ulcerative forms of scarlet fever, and ulceration in diphtheria, the throat may be syringed with eusol, freshly prepared chlorine water, sanitas, or the alkaline wash, frequently Ulcers may be painted with silver nitrate, medical izal, resorcin, grs. 90 to the oz. of glycerinum acidi boricis

In all these diseases the nose and nasopharynx require attention, and particularly in measles and influenza, which often leave behind them chronic nasal sinus disease, which may at any time cause ear suppuration The patient should be instructed to close only one nostril at a time when blowing the nose If both sides are closed, and the nose cleared by a forcible blast, infective material may be forced up the Eustachian If a nasal douche is used, the vessel containing the fluid should be held only a few inches above the level of the nose, and the flow interrupted immediately gagging occurs, or ear infection may follow A coarse spray with an alkaline fluid, followed, after blowing the nose, by a fine spray of menthol and eucalyptol, is as useful as anything. Delsaux recommends a small piece of ointment of acid. boric grs xxx or resorcin grs v, ol menth pip m ii, vaseline l oz, sniffed well into the back of the nose, and allowed to liquify and remain as long as possible In young children the fluid can be dropped into the nose by a pipette

During the course of infectious diseases the ear drum should be examined daily, and at the first sign of inflammation the external auditory canal thoroughly disinfected. The inflammation is not always purulent at first, but a dirty external canal will soon make it

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and the remainder lightly packed into the canal, and some cotton wool placed over it The wick requires to be renewed frequently at first and the canal is cleaned out and lightly mopped out with spirit mops If there is any doubt about getting the wick into proper position, it is better to resort to the other method of The pus is removed by gentle syringing with boric lotion or saline This may at first need to be done every three hours when the discharge is very profuse, but it is advisable to reduce the amount of syringing done as soon as possible. Hydrogen peroxide drops used before syringing make the removal of the pus easier in many cases The ear should then be dried out and drops of collosol iodine or collosol argentum may be instilled. Spirit drops should not be used until the acute inflammation has subsided as they will cause intense pain. Another method is to mop out the discharge as far as possible, instil hydrogen peroxide, repeat the mopping and instil more hydrogen peroxide, repeating alternate mopping and drops until all discharge is removed from the canal A careful watch must be kept for the development of mastoid disease

Numbers of cases are only seen when the condition has passed into the chronic stage. When a case is first seen it is well to syringe away all discharge, dry out the canal and examine the ear to ascertain the position and size of the perforation. A plug of cotton wool should then be placed in the meatus and in 12 to 24 hours the patient be examined again when one can estimate the amount and character of the discharge. In this way a better opinion can be formed of the condition, the type of treatment to be adopted and the prognosis

When the Eustachian tube is involved the discharge is often thick, stringy and mucopurulent A mucoid discharge through a perforation in the lower anterior

heated over a spirit lamp and inserted into the ear relieve pain by the heat, and the anæsthetic effect of the carbolic and the glycerin is said to cause a transudate of serum, and unloading of the congested vessels Warm olive oil only relieves pain by the heat. Some recommend leeches to the tragus and mastoid, the canal being closed. The following prescription is of use to relieve pain while abortive treatment is being tried, and may possibly influence the course of the disease.

Fiat Pulv mitte viii Sig One powder every 4 hours

If the disease persists no time should be lost in disinfecting the external auditory canal and in making a free curved incision through the membrane (small ones are of little use) and this may have to be repeated If bulging has occurred the incision should include this A perforation may have to be enlarged if it has occurred before an incision through the membrane has been made, as frequently it is too small to give free dramage to the contents of the middle ear An anæsthetic is necessary for children and most adults Gas or ethyl chloride sprayed on a mask give sufficient time A few adults will remain sufficiently motionless to allow the incision to be made after anæsthetising the membrane with a mixture of equal parts of cocaine, menthol and carbolic If the membrane becomes whitish coloured the anæsthetic has taken effect, if it continues to be reddened it has failed to do so meision, or a rupture of an adequate size has taken place, the patient should he on the affected side to assist drainage Two methods of treatment may be adopted. (1) dry, and (2) wet In the former the end of a wick of ribbon gauze is placed against the opening,

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over the incudostapedial articulation, and below the posterior fold, generally indicate serious disorganization of the middle ear—Usually one or more of the ossicles is diseased and the bony wall and frequently the antrum Polypi may grow through such perforations It must always be remembered that the roof of the attic and antrum are thin bone and if diseased there is very serious danger of intra-cranial infection When the discharge continues very profuse in spite of treatment, one should always suspect mastoid disease, and the following procedure may help in the diagnosis. All discharge is mopped out of the canal and on inspection a bead of pus is seen in the perforation This is wiped away, but almost immediately another takes its place, the discharge thus appearing much more profuse than in an ordinary case of suppuration This is very suggestive of mastoid infection pulsating light reflex is seen in the bead of pus the diagnosis of mastoid disease can be made with certainty.

Blood in the discharge indicates granulations or polypi. A fistula in the posterior-superior wall of the canal is pathognomonic of chronic mastoid disease Granulations grow round and hide the mouth of the fistula, but it can be detected by means of a probe Granulations may be due to diseased bone or to simple inflammatory changes. In the former case bare bone can be felt with a probe. Polypi almost invariably mean bone disease.

A marginal perforation may indicate bone disease in that region, and one in the posterior-superior quadrant, involving both the membrane tensa and Shrapnell's membrane, indicates mastoid disease with few exceptions. The discharge in tuberculous disease is frequently thin and acrid, and in the early stages there may be several small perforations, but these rapidly coalesce to form a large defect in the

part of the membrane indicates infection through the tube

A perforation in the anterior-inferior quadrant, near the entrance of the Eustachian tube and perforations centrally situated about the tip of the handle of the malleus-such as are often seen in childrenusually indicate infection, which is often mild, but has become chronic through neglect, or from the presence of a pathological condition in the nose or naso-pharynx The prognosis is good so far as curing the discharge is concerned, as there is raiely bone disease amount of deafness which may develop in any case depends on other factors Disease of the attic or antrum generally produces a thick, creamy pus When the bone is diseased in these and other situations, the discharge is often foul and may be thin and Frequently when a case of chronic suppuration is first seen the discharge is intensely foul, due to neglect, but if, after proper treatment, this does not disappear, one of the following conditions is the cause -(a) bone disease, (b) cholesteatoms, or discharge coming from an area which is not being reached When cholesteatoma is present small whitish or vellowish-white masses will be found in the discharge from time to time They are very foul smelling when broken up A cholesteatoma may at times be seen through a perforation.

Perforations in Shrapnell's membrane are nearly always small and situated above the short process of the malleus. They usually indicate disease of the head of the bone or of the roof of the attic. When, as is often the case, the discharge is scanty, it spreads over the upper and back part of the membrane and external canal, and drying there may be mistaken for wax. Free discharge from one of these perforations indicates serious bone disease

Perforations in the posterior-superior quadrant

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are the only symptoms A profuse discharge, particularly if foul, is an indication for operation, unless rapidly diminished and deodorized by treatment. Such cases, even if this happens, must always be suspect

Perforations in the posterior superior quadrant generally indicate bone or antral disease If either of these is present, treatment may diminish the discharge, but operation is necessary to cure the condition It is of little use attempting to cure any case of chronic suppurative otitis media when there is an infective condition of the nose or naso-pharynx. The discharge may be temporarily checked but will recur until this is dealt with. We should also instruct patients to blow the nose gently and to close only one nostril at a time When the drum membrane is intact. forcible blowing with both nostrils closed will cause increased intra-tympanic pressure, but very rarely forces infective material any distance up the Eustachian If, however, a perforation is present it can easily be blown up the tube into the middle ear and keep the suppuration alight Treatment is in essentials the same as that for suppuration elsewhere, but adapted to a somewhat maccessible and delicate region. It consists of ---

(1) Free dramage and removal of the discharge as completely as possible

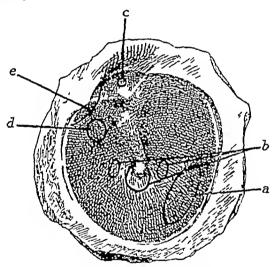
(2) Absolute cleanliness and the application of drugs to kill micro-organisms or promote healing

These desiderata are practically always conspicuous by their absence when the case is treated by one of the patient's family. Generally the ear is partially syringed out by means of a septic syringe with a leaky piston, only partially dried out and the drops instilled into the residual mixture of lotion and pus; so cases drag on interminably which could be quickly cured if dealt with by their doctor or a well-trained nurse. When

drum

As the size of the perforation influences treatment, this should be noted

As regards prognosis, cases with perforations in the lower part of the membrane and centrally situated offer a favourable prognosis for stopping the discharge when properly treated Cases with marginal perforations, except in the region of the aditus, are often of favourable prognosis as the bone disease, if present, is often slight and can be dealt with through the canal if necessary



Outer surface of the left tympanic membrane of an adult, enlarged 24 tumes

a Perforation due to Eustachian infection
 b Perforations frequently seen in children

c Perforation in Shrapnell's membrane

d Perforation over the incudostapedial articulation
e Perforation of membrane tensa and Shrapnell's membrane

Cases of perforation through Shrapnell's membrane require treatment by means of an attic cannula this means the disease is occasionally cured, but most cases are very resistant. If the hearing is good and the discharge seanty, these eases are best treated by keeping the canal clean, always provided that scanty discharge and slight deafness, which is not progressive,

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saying that if there is not a free outlet for the gas, septic material may be carried into uninfected areas Sometimes all that is required to clean the ear is the use of cotton-wool mops, the canal being then disinfected with spirit Politzer advocated the use of 10 drops of oil of turpentine in a pint of sterile water when the discharge is thin

A Higginson syringe with an ear nozzle is better than the usual brass syringe, and for home use an all-rubber syringe of about 3 oz capacity is useful and easily sterilized. All drops should be warmed. After they have been instilled into the canal this should be closed with the tragus, and by repeated pressure with the finger on this the drops can be forced through the perforation, in the majority of cases, into the middle ear and often through the Eustachian tube

Spirit drops 50 per cent are the most generally useful, being antiseptic, astringent and stimulating. When the mucous membrane is soft and velvety, or when small granulations are present, they are particularly indicated. Sometimes boric acid is added to the spirit, or if the discharge is foul \{\frac{1}{8}}\) gr to the oz. of hydrarg biniodide, but in most cases the spirit alone is best

In some cases when the mucous membrane is velvety and the discharge only scanty, 5 grs. to the oz. of silver nitrate rapidly effects a cure. Argyrol may be used. When the discharge is thick and stringy, and of a character pointing to Eustachian infection drops consisting of zinc sulphate grs. 15, in an oz. of equal quantities of glycerin and saturated solution of boric acid, are often most useful. Cases of Eustachian infection which do not clear up require applications to the Eustachian tube through a catheter.

Cases with great destruction of membrane and very little discharge may be dried up rapidly by using boric acid or dimol in a powder blower, but this line of

the discharge is free it is best removed by syringing Boric lotion or normal saline are as good as anything, and by their use one avoids the dermatitis which stronger antiseptics may produce I have seen 1 per cent lysol cause a number of cases of skin trouble To avoid producing vertigo as much as possible the lotion should be at body temperature and the stream directed obliquely against one of the walls of the canal and not directly at the middle ear, and one should not use much force To open the canal as much as possible the pinna should be drawn upwards and backwards in adults, directly backwards in children If the perforation is very large the lotion will penetrate and wash out the middle ear, but in a number of cases it does not do so, and whilst the canal is made clean the diseased area remains more or less untouched When the Eustachian tube is patent, the use of a Politzer bag will expel pus through the perforation in the lower part of the membrane, and if a valveless bag be compressed and released after the nozzle has been tightly inserted into the external meatus, the discharge may be sucked out of the region of the attic and aditus After syringing, the car should be dried out thoroughly The syringe should not be employed more often than is necessary Some cases require its use two or three times a day at the commencement of treatment, others only every other day or occasionally

Hydrogen peroxide is valuable in breaking up thick pus and facilitating its removal by the lotion. It is useful when the discharge is foul as it deodorizes, disinfects and cleans, and reaches areas which might remain untouched. If the discharge is slight it may be used without subsequent syringing, being dropped into the car, mopped out after an interval and the process repeated till bubbling ceases. If the perforation is rather small, some hold that it should not be used,

Deafness and Its Treatment.

By H NORMAN BARNETT, F.R CS Surgeon to the Bath Ear, Nose and Throat Hospital

HE incidence of deafness is so great that it is a subject of vital importance whether it be considered from the standpoint of individual affection or from that of economic national loss. subject has not received the attention it deserves when viewed from either standpoint. It has been regarded by those who are not affected with a calm indifference, which is not shared by those who suffer, and by the latter with a hopeless fatalism that is unequalled in the case of any other disorder. Deafness may be divided into three main classifications, that due to defect in the auditory nerve, that due to defects in the middle ear, and that due to changes in the bone of the labyrinth. The question of obtaining relief for the average case of deafness is one which must have occupied the mind of everyone, so common is the disability So long as deafness is limited to the tympanum, and nerve deafness and otosclerosis are not present, the outlook is hopeful

The two forms of deafness which are incurable with our present knowledge are those due to true degeneration of the auditory nerve, and those due to ankylosis of the inner ossicle, brought about by definite porotic bony changes in the labyrinth, commonly called otosclerosis. In considering a case of the former, one must be careful not to put down as nerve deafness a condition which arises from thickening of bone owing to age, or to some other causative factor. This can, as a rule, be differentiated by consideration of the comparatively advanced age of the patient or his comparative youth, as the case may be, and the absence of

treatment is contra-indicated by a small perforation Collosol argentum and collosol iodine are both useful

Collosol argentum and collosol iodine are both useful at times, particularly in children, or those who cannot tolerate spirit drops even when diluted, and mercurochrome and acriflavine are useful, but stain the tissues badly Ionization in properly selected cases is a most useful procedure, and I have found cases which obstinately resisted ordinary treatment improve rapidly.

In a certain number of cases it is impossible to get drops to reach the middle ear owing to the perforation being very small. They may be treated by taking a strip of fine ribbon gauze and placing the end against the perforation, and lightly packing the rest into the canal. This carries off the discharge as soon as it is formed, but unless the gauze is properly placed the procedure is useless. The other alternatives are treatment through a canula, or enlarging the opening, and this generally heals too rapidly after incision.

Granulations are best destroyed by a bead of chromic acid fused on to a probe, or by touching with liq ferri perchlor fort. The granulations must first be dried, or the caustic action spreads beyond the area to be treated. If the granulations are caused by bone disease some form of operation is usually needed. It is needless to say that when a polypus is present the first step in the treatment is its removal

DEAFNESS AND ITS TREATMENT

ankylosis of the base of the stapes with the fenestra vestibuli, is characteristic of otoselerosis; it is absolutely uncharacteristic of middle-car deafness, where the history is one of a very gradual, but progressive, onset. Remedial treatment in cases of pure established otoselerosis is quite hopeless at present, while it is productive of good results in practically every case of middle-ear deafness.

With regard to the radiological examination of the condition of the bone of the labyrinth, while we are not at present in a position to state dogmatically that an X-ray picture of osteoporosis is a proof that otosclerosis is present and excludes the diagnosis of middle-ear deafness, or vice versa, yet the weight of present evidence points in that direction. In a series of cases at the Bath Ear, Nose and Throat Hospital recently investigated by Dr. Forgan Grant, who employed the technique of Dr. Graham Hodgson, it was found that in those cases which were clinically diagnosed as middle-ear deafness the bone of the labyrinth was normal, while those diagnosed as otosclerosis showed osteo-porosis.

It would be of infinite value to clear thinking if, first, the term otosclerosis were abandoned for designating a condition of osteoporosis, and, secondly, if the disease were considered as one of the labyrinth, for it is improbable that any of the structures of the tympanum are involved, with the single exception of part of the base of the stapes. If this were done the term middle-ear deafness could be reserved for the condition which affects the structure of the middle-ear only, and there would be no suspicion that in referring to middle-ear deafness otosclerosis might be meant

The tinnitus of true otosclerosis is of a very intense character, as is to be expected when the pathology is considered. All attempts to cure otosclerosis by operative or other means have failed, and the only thing that

any pathological condition which may have given rise to thickening of bone Also from the fact that the decrease in bone conduction is not so marked in those cases where the bone is thickened by age or disease, as in those in whom the nerve is degenerate.

With regard to otosclerosis, there can be little doubt, in my opinion, that many cases are attributed to this condition in which there is no true bony ankylosis of the It is in my experience a rare condition compared with the enormous number of people who are suffering from deafness, and the fact that a patient has marked chronic deafness, combined with tinnitus aurium, whose Eustachian tubes are clear and tympanic membranes apparently normal, does not necessarily mean that he is suffering from otosclerosis

DIFFERENTIAL DIAGNOSIS

Otosclerosis

Tympanic membrane unaltered

Bone conduction increased Eustachian tube clear

Tinnitus a pronounced symptom preceding or co-existent with onset of deafness

Progression not a marked symptom Onset of deafness often sudden and quickly becoming very bad

Treatment of no avail

Occurs in young life

Porosis of bone of labyrinth More usually bilateral

Middle-ear Deafness

Tympanic membrane usually altered

Bone conduction normal Eustachian tube may be obstructed

Tinnitus absent or present in minor degree, and coming on after first onset of deafness

Deafness gradually progressive in every case

Treatment relieves and frequently cures May occur in young life, but more usually in middle or later life Bone of labyrinth unaltered

More usually unilateral

It is quite the exception to find the tympanic membranes normal in middle-ear deafness, while tinnitus. one of the most distressing symptoms of otosclerosis. is either entirely absent or is comparatively negligible. The rapid onset of marked deafness in young adults. corresponding probably with the period of bony 128

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The tinnitus of true otosclerosis is of a very intense character, as is to be expected when the pathology is considered. All attempts to cure otosclerosis by operative or other means have failed, and the only thing that

is of the slightest use to relieve the symptoms is to employ ionization, using reversed poles in order to soothe nerve endings, a certain amount of irritation is thus got rid of and the patient is relieved to some little extent of the terrors of grave tinnitus. Landry and Franquet, however, claim some good results from ionization with silicon and calcium, and E. Watson-Williams from administration of parathyroid gland.

There remains to be considered deafness which is associated with the middle-ear, or tympanum, only. The small chamber of the middle-ear is open to possible infection from the throat through the Eustachian tube, and through the tympanic membrane should this become perforated from any cause. This is a distinct entity and is not associated with any change in the bone of the labyrinth or accompanied by bony ankylosis of the stapes. Such deafness accounts for the great majority of all cases, but when far advanced, with firm adhesions between the ossicles, it may simulate otosclerosis, especially in those cases where the condition present has not produced any marked changes in the tympanic membrane.

The two chief causes are infection reaching the tympanum through the Eustachian tube, and structural defects of the nose. The former is divided into conditions which set up acute inflammation, and those which set up chronic inflammation. Acute inflammation, if resolution takes place soon, will produce only a limited degree of deafness; if suppuration results, an ordinary suppurative office media takes place. The most common infections to produce this result are scarlet fever, measles and influenza. Deafness may or may not be marked during the acute phase of these conditions, but in many cases absorption of the exudate is not complete, and frequently years afterwards deafness results as an apparent chronic progressive disorder which has really had its origin

in an infantile attack of measles or scarlet fever.

Chronic inflammation of the middle-ear is caused chiefly by chronic septic conditions of the tonsils, nasal septic conditions, and deformities, especially deflection of the septum, and enlargement of the posterior ends of the turbinate bones. Such conditions are responsible for middle-ear deafness by infection of the tympanum, or by obstruction of the air channels and blocking of the Eustachian tubes. The condition set up may first affect the Eustachian tubes or be primary in the tympanum.

In considering the pathological condition present in the tympanum, one has to be guided by deduction and inference, and by the clinical picture, rather than by the pathological specimen The reason for this is that the condition is not of such a nature as to be easily demonstrable post-mortem It is easy to show such changes as those present in otosclerosis where a definite bony fixation exists It is quite a different matter to be able to demonstrate adhesions of a nonbony character under post-mortem conditions; the very preparation of the specimen may well break down the adhesions But deduction and inference are surely not difficult when we remember what frequently takes place during an ordinary cold-how the Eustachian tubes and middle-ear become affected, leading to temporary deafness, and how middle-ear infections occur in conditions associated with tonsil and pharyngeal inflammation, such as, for instance, scarlet fever

By means of such infection, whether arising from diseased enlarged tonsils, pharyngeal or nasal sepsis and deformity, there is set up a mild inflammatory condition of the lining of the middle-ear which, if not dealt with promptly, tends to become chronic. The inflammatory exudate gradually becomes adhesive in quality, and attaches itself to the ossicles, making them adhere one to another, and at times to the internal

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surface of the tympanic membrane, oscillation of the ossicular chain becomes less, and as years progress the character of the binding material becomes changed, hardening takes place, and the adhesions become more and more organized and the ossicles more firmly bound together, until they cease to respond to vibration and the tissues of the tympanum become changed by the chronic inflammation

Some may ask what pathological evidence is there to bear out this hypothesis? It may be answered that it has never been seriously looked for, and even if it were, as already pointed out, post-mortem conditions and the removal of the bone and opening of the tympanum would in all probability interfere with its recognition. On the other hand, such a view of the pathological process is consistent with the processes we know are set up by inflammation of these parts, and with the symptoms of chronic middle-ear deafness presently to be discussed. Moreover, we have an example in the adhesive material found between ossicles that have been removed during a mastoid operation, which is the result of septic inflammation in the tympanum

There are certain cases in which there is no preexisting suppurative office media, or nasal or pharyngeal infection or obstruction. It is probable that in such cases the tympanum is infected through some transitory naso-pharyngeal affection which, passing off, leaves the condition of the middle-ear in such a state as to produce much the same results

The outstanding symptoms are the difficulty in hearing all air-borne sounds, and the difficulty of interpreting those heard, sometimes accompanied by tinnitus which, as a rule, has developed at a later date than the onset of deafness

On examination, the tympanic membranes are usually retracted, dark in colour, with light reflex

DEAFNESS AND ITS TREATMENT

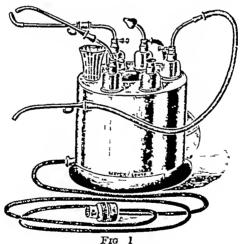
abolished or reduced, though in some cases the membrane may appear normal Bone conduction is unaltered, or somewhat reduced if the patient is advanced in years or in those where some nerve deafness complicates the case Rinne's test is negative, and the tuning-fork notes, both high and low, are much reduced below the average, though the high notes are heard better than the low Gellé's test is, as a rule, positive, though in certain advanced cases the stapes may be held very firmly, though not with bony ankylosis, and the test will be negative The watch note is reduced in length, may be absent, or heard only on pressure. The conversational voice is heard with more or less difficulty, and varies between a few inches to a few feet, while the whispered voice may not be heard at all, or only at a few inches range

Treatment -The essential objects are to induce reabsorption of the products of chronic inflammation in the tympanum, and re-education of the dormant centre of hearing. In many cases before this is undertaken it is necessary, on general surgical principles, to remove diseased and enlarged tonsils, deflected nasal septum, or enlarged and diseased turbinates having thus been cleared, vaporized iodine at a fairly high temperature is passed into the tympanum through the Eustachian catheter An ordinary standard length No 1 silver catheter will be found the most serviceable, but long and short catheters should be ready for those cases with a long nasal passage and for children, while No 2 and 3 sizes will also be of service for those with wide nasal passages The addition of a little camphor and carbolic acid is of advantage, and this combination is presented in a very handy form by Messrs Oppenheimer in their No. 8 neboline I have recently used sodium silicate, 5 per cent, as an alternative to iodine in some obstinate cases, but I

am not convinced so far that it has any advantage over iodine.

The reasons why the treatment by means of medicated vapour formerly fell into disrepute are that the predisposing septic or obstructive causes were frequently not removed, the vapours were often unsuitable and used cold and damp instead of hot and dry, the time during which treatment was carried out was not nearly long and continuous enough, and the ionization and re-education of the centre were not combined with the treatment of the tympanum

The type of vaporizer is of importance, as it must be a powerful one, producing a large volume of dry vapour at a fairly high pressure. This is obtained by using a No. 80 De Vilbiss vaporizer having a glass tube to go into the liquid, and a specially wide bore to avoid



Set of vaporizers for using warm iodine, carbolic and camphor vapour. The liquid from which the vapour is obtained is heated by means of a central carbon electric bulb. It is dried by a horizontal metal plate within the bottle, and is passed through the Eustachian catheter direct or preferably through a rubber tube connecting the vaporizer with the Eustachian catheter. The stand also contains a washing-out spray for the naso-pharynx, together with a spare bottle and water container.

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blocking of the tubes The required temperature is produced by a carbon filament in the centre of the stand

The nozzle of the vaporizer may be ground so as to fit a Eustachian catheter, but the easier method is to make the junction between the catheter and the bottle by means of a rubber tube with fittings to adjust at either end. The pressure required to produce the vapour may be applied by a large-size hand rubber bulb or an air-pump. I prefer the former, as the pressure of the vapour in the middle-ear can be better regulated. An auscultation tube had better be used for this purpose as well as to verify the position of the catheter.

The technique for passing the Eustachian catheter must be learned by practical experience · it can never be acquired by reading Such a degree of efficiency should be attained that the instrument can be quickly passed without pain to the patient and without having to feel about for various "landmarks" Each case requires individual study, and no law can be applied to them all The most expert may occasionally give pam, and fail to reach the tube, or pass the catheter in the wrong direction The old rules of either passing the Eustachian catheter to the posterior wall of the pharynx, rotating the beak outwards so that the evelet points to the outer canthus of the eye, and drawing forward over the bulging posterior lip of the Eustachian tube (Binnafont or Kramer method), or hooking the beak on the posterior edge of the septum and rotating the tip downwards and outwards through rather more than half a circle (Lowenberg method), may at times be useful, but are not by any means to be depended upon for finding the Eustachian tube in all cases The wisest procedure is to pass the Eustachian catheter along the inferior nasal passage, and as soon as the beak has passed into the naso-pharynx, turn it outwards through half a circle, press the outer end

against the septum, and gently feel the way, rotating slightly up and down, till the tube is reached. It is not necessary or desirable to pass the catheter up the tube, but only to engage the orifice, and the catheter should be held very lightly and negotiated with the utmost gentleness. If the bulb of the vaporizer is gently pressed as the catheter feels for the orifice, the passage of the vapour will be heard at once by the auscultation tube, and confirmatory evidence of the position will be obtained

Ionization is carried out with the same object as vaporization of the tympanum, namely, to cause resolution of the products of inflammation. Iodide of potash, or the French tincture of iodine, is used for the negative pole, and sodium chloride for the positive. Since the publication of the experiments of Landry and Franquet, of Rheims, I have also used silicon, but have not had any better results with it. The experiments referred to are of importance, as they would appear to demonstrate what the chinical results obtained had led one to believe, that the drug chosen can be introduced into the tissues in a nascent and pure condition. The application may be made in the external auditory meatus, or over the mastoid, personally I obtain better results from the latter position.

The current must be from the main. The negative electrode (size about 3 by 2½ ins.) is applied behind the ears over the mastoid area on a pad of lint sixteen layers thick soaked in a 2 to 4 per cent solution of potassium iodide. The positive electrode (size about 7 by 5 ins.) is placed over a pad of the same thickness soaked in sodium chloride and placed under the hands. The electrodes and pads should be bandaged firmly, the current started very gradually, indication of tolerance being reached when the patient feels "something"—perhaps giddiness, a pricking heat behind the ears, or a salt taste in the mouth. The current used will vary

DEAFNESS AND ITS TREATMENT

with the individual Some patients, I find, never get beyond 5 ma, but 10 ma is about the average Exceptional pronounced cases may go up to 20 ma with advantage, but on the whole I am in favour of the current being fairly low, as better results are usually obtained

With regard to time, if there is no contraindication in the patient's condition, the application should be made for fifteen minutes. It is very important that the time should not be long, as in most cases where it is giddiness is experienced. At times, in very obstinate cases, the electrodes are reversed, the positive pole being put behind the ear and the negative in the hand. In this case sodium chloride is used instead of potassium iodide. The negative pole stimulates and excites and promotes vasomotor dilatation, the positive pole depletes and soothes irritable nerve endings. The number of applications should be ten, administered every other day if the patient's skin can stand it. After that I give a little rest and go on for another ten, administered every other day.

The value of ionization in treating these cases is great, as can be proved by omitting this part of the treatment in control cases, comparing them with others who have had it, and then giving the controls ionization in addition to the other parts of the course

Re-education of the centre is carried out by means of a binaural speaking tube, into which the patient reads aloud, or is spoken to, for a ten minutes' sitting three times a day. This is a very important factor in treatment, since httle or no stimulation by sound has reached the centre in many of these cases for years, and the best re-education medium is the human voice. The removal of the obstructing media is not sufficient, as the power of interpretation of sounds has become dormant. The more intelligent the patient, the more



Fig. 2 —The method of using the re education tube

rapid is the recovery of this power.

To break down adhesions and promote renewed elasticity of the tympanic membrane, oto-massage is employed; the stroke of the piston should not be too long, and the application should be brief at each sitting

In a comparatively recent series of a hundred cases, taken in order of index cards and not, therefore, picked in any way, 96 per cent were cured or much improved, 3 per cent only slightly improved, and 1 per cent was not improved at all. This case was one in which the patient had had several quite unusual mental shocks and whose nervous system was abnormal. Of these

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cases, some have not been seen, though heard of again, some have come for a refresher course at inter-

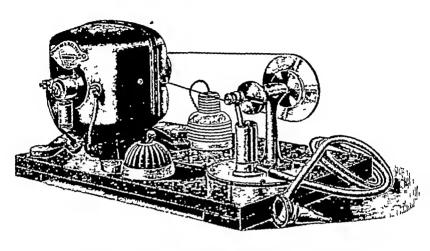


Fig. 3—Oto masseur for breaking down adhesions between the ossicles and the ossicles and tympanic membrane, and increasing the elasticity of the tympanic membrane. A conical rubber nozzle, fitting the meatus snugly, replaces the Siegle speculum shown in the engraving

vals, and one comes once a year to be kept up to concert pitch, though he is really not noticeably deaf now. In certain cases the improvement is so gradual that the patients' testimony is not always reliable, and only comparative tests can be depended on to show the real extent of the progress.

The following table gives details of fifty of the hundred cases referred to It will be noticed that it so happens that most of these cases are in middle life or over; other series of cases, while containing more of a younger age, would give about the same results. The fact that these cases are for the most part not adolescents, emphasizes the differential diagnosis from otosclerosis.—

Reference.	Age	Sex	Predisposing Factors	Recurrenc	
A	69	M	Old middle-ear inflammation	No	
,,	49	1 1 -		,,	
B	64	M	,,	,,	
"	71	\mathbf{F}	Nasal sepsis	,,	
,,	48	M	None	Slight	
,,	46	M	Septic tonsils	No	
"	64	\mathbf{F}	1 -	,,	
"	50	M	Middle-ear inflammation	,,	
,,	64	F	Old suppurative middle-ear disease	,,	
	57	\mathbf{F}	Deflected septum and septic tonsils	,,	
"	68	M		,,	
"	60	F	Septic tonsils ""	Yes	
,,	71	Ē	Old suppurative middle-ear disease	No	
"	59	$\tilde{\mathbf{F}}$	Deflected septum and septic tonsils	1	
"	71	F	Deflected septum	"	
"	$2\overline{3}$	Ē	Septic tonsils	Yes.	
"	71	M	None	No	
17	37	F	Deflected septum and septic tonsils	Yes	
,,	43	M	Septic tonsils		
"	69	M	None	No	
"	68	M	Septic tonsils		
"	45	F	Old suppurative middle-ear disease	"	
"	74	F	None None	Ϋ́es	
	58	M	Septic tonsils	No	
"	51	M	{		
"	30	F	", " and septum (hereditary)	Ϋ́es	
"	31	M	Shell concussion	Ño	
ő	54	(Septic tonsils	Yes	
_ 1	52	ř	Shock		
,,	79	-	Nasal obstruction	"	
"	14	"	T and A	$ m \H{n}_{o}$	
**	35	"	Septic tonsils		
"	27	"	Old suppurative middle-ear disease	"	
Ë	11	F !	Septic tonsils	"	
ויצג	16	M	Deflected septum and septic tonsils	"	
"	62	M	Septic tonsils	"	
,,	42	F	Deflected septum	"	
"	77	F	Septic tonsils	"	
"	47	M	-	"	
$\ddot{\mathbf{F}}$	61	F	,, ,	"	
_	71	M.	None "	"	
"	27	\mathbf{F}	Septic tonsils	"	
"	55	M	Nasal obstruction	"	
"	50	M	Sentic tonsils	,,	
Ğ	53	F	Old suppurative middle-ear disease	"	
- 1	76	$\bar{\mathbf{F}}$	Septic tonsils	"	
"	9	\mathbf{F}	None	,,	
"	57	M	Sentio tonsils		
ੌΗ	59	,,	Deflected septum and septic tonsils	"	

DEAFNESS AND ITS TREATMENT

Result	Туре	Date	Tympanic Membrane	Length of Treatment.
Good	Moderate	1928	Affected	1 month
Cure	,,	1927	,,	3 weeks
11	,,	1928	,,	5
"	11	,,	,,	6
,,	Bad	1926	,,	6 ,,
"	,,	1927	,,	4 ,,
Good	,,	,,	,,	4 ,,
"	,,	,,	,,	4,,
33	,,	,,	,,	4 ,,
Very good	,,	,,	,,	4 ,,
Good	,,	,,	,,	4,,
"	.,,	1925	23	3,,
"	Very bad	1926	,,	5,,
,, ,,	,, ,,	1927	,,	4 " " " " " " " " " " " " " " " " " " "
Fair	7, 7, 7	1926	,,	4 "
Good	Bad	1923	"	9 ,,
, ,,	**	1927	"	4,,
Fair	"	"	"	5 ,,
a",	"	7.00	"	3 ,,
Good	,,	1924	**	3,
11	"	1927	"	4 ,,
"	11	"	"	3 "
Very good	,,	1924	"	5 ,, 5 ,,
_	"	1924	"	5 ,,
Poor "	Very bad	1916	"	6
Fair	1	1927	"	5
Good	Bad "	1924	"	5 ,,
Bad	Very bad	1927	"	5 ,,
Fair	} -	1928	"	6
Good	33 33		,,	9 "
Fair	Bad "	1926	"	4 "
Good	,,	1	"	າ ິ
**	,,	"	"	Λ
11	,,	1928	"	4 ,,
Fair	Very bad	1926	,,	ē "
Good	,, ,,	,,	,,	5 ",
11	Bad	1928	,,	5 ,
Fair	Very bad	1927	,	4 ,,
Good	Bad	>1	,,	6 ,
"	Very bad	1925	,,	4,,
**	Bad	7004	,,,	4 ,,
23	,,	1924	Not affected	3 ,,
"	>,,	1927	Affected	3 ,,
"	22	1928	,,	4 ,,
23	"	1927	Not offeeted	3 ,
11	"	1	Not affected Affected	3 ,,
•	"	1929	1 1	5 ,,
"	"	1028	"	3 ,,

The Alleviation of Chronic Deafness.

By GEORGE C CATHCART, M.A., M.D.

Consulting Surgeon to the Throat Hospital, Golden Square, W, late Member of the Special Aural Board, Ministry of Pensions

NE of the most difficult problems to confront the practitioner of medicine is the treatment of chronic deafness This problem has occupied my close attention for some thirty years and my interest in it has had a personal element because I have been handicapped throughout my professional life by slight chronic deafness last generation the surgical side of otology has made great and notable advances, but in the opinion of the majority of otologists the treatment of chronic deafness remains much where it was forty or fifty years ago Indeed I have often noticed that many leading otologists shrug their shoulders and avoid the subject when the treatment of chronic deafness is mentioned, yet, on the other hand, welcome the discussion of its pathology, which so far has led only to a dead end. It seems to me, however, that to us, as medical practitioners, the main problem is the arrest and alleviation of the disease and not the search, however "scientific," for its cause

About seventy years ago Sir William Wilde, the Dublin aurist, now chiefly remembered as the inventor of "Wilde's incision," summed up deafness and its treatment in an aphorism worthy of his ill-fated son, the dramatist. "There are two kinds of deafness, one is due to wax and is curable, the other is not due to wax and is not curable." This is largely true still, because we know so little about the ear, indeed, we do not yet begin to understand how we hear. But

still we progress, a few years ago the presence of an intact drum and ossicles was considered an absolute essential to hearing, and a large number of the laity, even the well-educated, still raise strong objections when the question of paracentesis is mooted. It is now known, however, that the sounds probably reach the inner ear by means of the round window and so long as the inner ear is healthy it does not matter much about the drum

Chronic deafness is of two kinds first, that caused by a lesion in the sound-perceiving apparatus, called nerve deafness, and secondly, that caused by a lesion in the sound-conducting apparatus, which is divided into chronic otitis media (also called chronic catarrhal deafness or chronic adhesive process in the middle ear) and otosclerosis But whatever may be the diagnosis, the view of most otologists has been that treatment is of little or no avail in any one of these conditions For many years I had been of the same opinion as other otologists and had got tired of having to tell my deaf patients, after the classical remedies had failed, that nothing more could be done for them, when some years ago an old patient who had tried every kind of treatment for his deafness and tinnitus told me that he had just heard of a new treatment that was being carried out by Dr Helsmoortel of Antwerp He asked me if I thought it would be of any use for him to try I gave him the answer that John Hunter gave Jenner, when he said he was thinking about vaccina-"Why think, why not try?" On making further inquiries my patient found that the treatment had originated with a M. Zund-Burguet in Paris, and accordingly he went to see him My patient, who was aged 43, had had otosclerosis for many years, a radical mastoid operation had been performed on the right side some ten years before, and he could only hear with a speaking tube on either side What

troubled him most, however, was continuous timutus. The result of the treatment was that the deafness was relieved slightly, though he still had to use his speaking tube; the noises, however, were so much lessened that life once more became enjoyable.

I was so impressed with the successful treatment of my patient that I went to see M. Zund-Burguet myself and received treatment, which benefited both my deafness and my tunnitus I found that he was not a physician but a physicist and had therefore attacked the problem of deafness at a different angle from the traditional one of the medical practitioner He had been led to do this because he had been engaged for some years in research work in phonetics and while doing so had worked out a theory of deafness on which he founded his physiological system of treatment by the electrophonoide method.

Zund-Burguet came to the conclusion, as Urbantschitsch had suggested some years before, that the best way to get the deaf to hear was to re-educate the ears with the sound of the human voice, which gives a physiological stimulus not included in any of the ordinary medical or surgical methods of treatment. Urbantschitsch had attempted to use human voices, but his method was found to be impracticable Zund-Burguet wished to reproduce as far as possible the same kind and number of vibrations as are contained in the whole range of human voices—bass, tenor, contralto and soprano After many experiments and disappointments he was able to overcome the inherent difficulties of the problem and get constructed the instrument he calls the "Electrophone"

This instrument reproduces the sound vibrations of the whole gamut of the human voice and thus gives the requisite physiological stimulus to the ear. contains three mechanical larynges in which the vocal colds are replaced by vibrating platinum lamellæ.

CHRONIC DEAFNESS



these are capable of producing, in their desired intensity, sounds resembling those of the human voice, extending over five octaves and passing not merely through the tones and semi-tones, but through all the vibrations between 80 and 3,500. This is done by sliding the platinum contacts along the vibrating lamellæ, the action resembling the movements of the fingers over the strings of a violin.

It should be emphasized that the sounds produced are of varying quality and are variable at will. These sounds are rich in low, middle, and high harmonics, but are purposely devoid of shrill ones. They are transmitted to the ear by telephone receivers, modified by having the microphone discs fixed, this arrangement of the discs provides a uniform amplification of all the low vibrations, which is an essential factor.

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CHRONIC DEAFNESS

useless to go on Another disadvantage is that as the deafness is chronic and progressive, and the improvement obtained after the full course lasts as a rule only six to nine months, in order to keep up the improvement another course is required at the end of that time Sometimes, however. I have known the improvement to continue for one or two years without any further course of treatment

In 1925 I published in the Lancet (1, 1925, p 968) a record of one hundred cases of chrome progressive deafness treated by the Zund-Burguet electrophonoïde method, and I now wish to place on record in The Practitioner the total number of cases of chronic deafness which I have treated, with my successes and failures. In my previously published series of 100 cases, 68 per cent definitely improved after treatment, comprising 81 per cent. of the cases of nerve deafness, 67 per cent of the cases of chronic otitis media, and 55 per cent of the cases of otosclerosis Up to the present time I have treated a total of 637 cases of chronic deafness by the Zund-Burguet electrophonoide method, comprising 171 cases of nerve deafness, 253 cases of chronic otitis media, and 213 cases of otosclerosis recognize that this division of cases is somewhat arbitrary and that other otologists would probably sub-divide the cases differently Be that as it may, however, all the patients are undoubtedly cases of chronic progressive deafness and nearly all of them had previously been treated by other otologists by the classical methods without success Of my 171 cases of nerve deafness 126, or 73.6 per cent, improved, while 45 did not improve to any appreciable extent Of my 253 cases of chronic otatis media, 168 or 66 5 per cent improved, while 85 did not improve Of my 213 cases of otosclerosis, 115 or 53 9 per cent. improved, while 98 did not improve This gives a

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The strength of these microphonic transmitters is also variable at will, and thus can be adjusted exactly to the sensitiveness of each ear Finally—and this is one of the features of the electrophone which differentiates it from all other mechanical methods of treatment—a secondary current can be superimposed on the primary one which makes the sounds Thus. in the neighbourhood of the transmitters, a gentle disturbance of the air takes place which produces a vibratory massage of the auditory tract This phonic massage is felt in the ear as a gentle tickling sensation, which is quite agreeable to most deaf people first treatment is usually followed by the diminution and even by the disappearance of the feeling of fullness in the head, of which the deaf, especially those suffering from otosclerosis, so often complain

The treatment labours under the disadvantage that it is not possible to tell from tests made beforehand whether it will be successful or not. There is a factor in deafness as yet unrecognized, the presence of which -or it may be the absence of which-determines the It may be, as has been suggested, that this is the functional element present in many cases of The usual course of treatment consists of thirty sittings, but on account of this unknown factor it is necessary to give a preliminary course of twelve treatments, if there be any considerable improvement it is worth while giving a full course, but if there be no improvement it is not. The improvement must be considered in relation to normal hearing and not merely in relation to the amount of hearing the patient had previously, for instance, if a patient hears the ordinary voice at six inches or a foot and that distance be mcreased to one foot or two feet, even though the improvement be 100 per cent or more, it leaves the patient, for all useful purposes, as deaf as before and the improvement is in reality negligible, so that it is

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Aids for the Deaf.

BY H MORTIMER WHARRY, FRCS

Surgeon to the Throat and Ear Department, the Bolingbroke Hospital, London

Thes within the power of family practitioners to popularize the use of aids for the deaf, and so to mitigate a vast amount of suffering which is at present undergone by deaf people and their relations and friends because of the unwillingness of the patients themselves to make use of anything which calls attention to their disability. Those who are incurably deaf or partially deaf, necessarily live in a little world of their own and can only be approached by their friends making exceptional efforts to make themselves heard and understood

It should be explained to them that they cannot expect all and sundry to learn a specially distinct way of talking, but that the onus lies upon deaf persons to make themselves approachable by the use of one of the many excellent aids to hearing which are available. They should learn that they cannot conceal their deafness for long, and that they are far more acceptable to their friends if they proclaim their deafness and defeat it by using an instrument, than they are if they pretend to hear what they do not and so cause general uneasiness and misunderstanding

It is better for both the deaf and those who deal with them to co-operate in understanding each other, than to throw the burden entirely upon those who have to make themselves heard, often at the expense of causing a great nuisance to others of normal hearing, whose ears are assaulted by the shouting of those who are endeavouring to make the deaf hear

Attempts have been made by otologists to find out what type of instrument is most suitable to each

total of 637 cases of chronic progressive deafness, of which 409 cases, or 64 2 per cent, improved after treatment by the Zund-Burguet electrophonoïde method, while 228 cases did not improve

These results would seem to show that the electrophonoïde method of Zund-Burguet, properly carried out, is a substantial advance in the treatment of chronic progressive deafness. The method, it must be admitted, has not yet received the general approval of otologists, chiefly, I believe, because of early prejudices which have not yet been lived down, the most influential being the open scorn of Politzer for the re-educative methods of Urbantschitsch Nevertheless, its value is gradually beginning to be recognized all over the world, for to my personal knowledge electrophones have of recent years been acquired and are being used by otologists and also by general practitioners in London and the Provinces, in Scotland, South Africa, Australia, India, the West Indies, the United States of America, Argentina and Brazil The method cannot effect a cure of chronic progressive deafness, but it can certainly bring about an alleviation of the condition in a large proportion of cases hitherto deemed beyond hope of relief

AIDS FOR THE DEAF

indoors and at meals

- (3) Speaking Tubes—These are of the greatest value for the very deaf, especially when they wish to carry on a prolonged conversation with a single individual. They are made in a small and easily portable form and enable both parties to a conversation to speak in a natural voice without strain.
- (4) Ear Trumpets These are for those a little less deaf They are made in a multitude of shapes and sizes. The patient as a rule need only direct the mouth of the trumpet in the direction of what he or she wishes to hear
- (5) Two-way Speaking Tubes—In the education of deaf children the necessity of their hearing their own voices is so great that two-way speaking tubes are made so that they may hear themselves speak and also listen to the voices of others

ELECTRICAL AIDS

These consist of a receiver, an electrical battery, and an ear-piece. They vary from small instruments costing three pounds or so, to large and exceedingly powerful machines costing twenty pounds and sometimes a great deal more. They vary also in their utility. The small ones are easily worn. The receiver is hooked on to the coat or waistcoat button-hole, the battery is carried in a pocket, and the ear-piece is worn over the ear. Special arrangements are made for ladies. They vary in price from three to fifteen guineas.

The large instruments are very powerful and the receiver and battery are carried in a case the size of an attaché case. They are of great value for the use of very deaf persons at meetings of committees and boards of directors, where the instrument is placed on the table in front of the patient. In this way men of wide experience and great ability can take an active part in affairs which would be beyond them if they did not

particular form of deafness¹, but, with one notable exception, it will usually be found that the occupation and circumstances of the patient are of greater consideration than the actual diagnosis in finding the right instrument. I will therefore give a short compendium of different kinds of artificial aids with an example of the use of each which may serve as a practical guide

NON-ELECTRICAL AIDS.

- (1) The Artificial Drum—This is the exception which is spoken of above. It is useful only in such cases as have a large perforation in one or both membranæ tympani. The drum itself consists either of a small pad of cotton wool, or else of a small rubber disc attached to a small wire at its centre. The drum is passed into the meatus until, by experiment, it reaches a position where the hearing is greatly improved. Unfortunately it is only useful in a small percentage of cases. But it should always be tried, as it gives great relief and is not visible.
- (2) Auricles—These consist of a metal or tortoise-shell horn or a pair of horns, the moveable points of which fit into the meatus, while the rest of the horn winds behind the pinna to reach a wide mouth which faces forwards—Each is held in position by a band passing over the head—In women they can be hidden by the hair, but in men they are plainly visible—They are useful for conversation only and are not successful in severe deafness—But they have the advantage of leaving both hands disengaged

As an instance of their great utility I may mention the case of a chemist who could not quite catch what his customers said across the counter, because he was deaf in one ear, but by wearing an auricle in the deaf ear he could hear everything they said His customers realized the necessity to talk plainly, and it was unnecessary for them to repeat themselves, or for him to explain that he was deaf Also he had his hands free for his business

It is obvious that these instruments are of great use

THE PRACTITIONER Fifty Guineas Prize.

CONTROLLING EDITOR:
SIR HUMPHRY D ROLLESTON, BART, GCVO, K.OB., MD, FEC.F
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R. SCOTT STEVENSON M.D., F.R.OB.E

In order to encourage the writing of original articles by junior practitioners, The Practitioner offers a prize of 50 guineas for the best article written by a medical practitioner who has been qualified for not more than two years by December 31st, 1929. A second prize of 10 guineas, and a third prize of 5 guineas are offered under the same conditions. Articles must not be less than 500 or more than 2,500 words long, and may be illustrated, though this is not essential. Articles may deal with any branch of medicine, including surgery, midwifery, pathology, physiology, public health, etc. Articles dealing with clinical subjects should include case-notes of not more than three cases personally observed by the author

Articles intended to compete for this prize must be sent before July 1st, 1930, to The Editor, The Practitioner, 6–8, Bouverie Street, London, EC4 They should be signed by a pseudonym, and accompanied by a sealed envelope containing the author's full name, address, qualifications, and hospital appointment, if any.

The Editors of The Practitioner will be the sole judges of merit and admissibility, and their decision must be accepted as final.

make use of the facilities which the manufacturers of these instruments place at their disposal. All these electrical aids need relays of dry cells at intervals, depending upon the use they receive

Although, for various reasons, I cannot go into greater details in the specification or recommendation of one instrument rather than another, I hope that these few words may serve to indicate possibilities and provide a general guide in dealing with an ever-present problem. I always look forward to a time when aids to the deaf may be in such common use that not even the most sensitive need feel self-conscious in using one I need hardly say that my remarks refer only to those patients in whom the proper treatment has failed to restore useful hearing.

Reference

¹ Discussion on Artificial Aids to Hearing Proceedings of Royal Society of Medicine, Section of Otology, Vol. XVIII, 1925 p 37

meatus to the inner wall. A strip of rubber tissue was placed in the posterior wound as far as the aditus and the ordinary pads were applied. The advantages of this method were that the whole operation could be completed in half-an-hour, except in very difficult cases, there was no graft to cut, there was no pain in the after-treatment, there was no possibility of cicatrization of the canal, and the posterior wound was under daily observation—(Medical Journal of Australia, October 19, 1929, p 565)

The Treatment of Vasomotor Rhinitis with Vaccines

Th. Thjotta, of Oslo, reports a series of cases of vasomotor rhimitis successfully treated by autogenous vaccines. As those patients who suffered from typical vasomotor rhimitis with attacks of sneezing were all much benefited by the vaccine treatment, while those who suffered from pure hydrorrhæa without sneezing were unaffected by the same treatment, the author suggests that these two conditions differ as regards etiology. The symptom that seems to be of the greatest diagnostic value is a more or less severe tendency to sneeze, especially in the morning. The symptoms, together with the prompt result of the treatment with autogenous vaccines, and not least the typical focal reactions of the nasal membrane, strongly point to bacterial allergy as the etiology of the disease—(Acta Oto-Laryngologica, Stockholm, 1929, vol. xiii, Fasc. 3, p. 327.)

The Treatment of Lung Abscess by the Bronchoscope

F R Herrman and F Welker recommend that lung abscess should be treated by aspiration and cleansing of the cavity with the aid of the bronchoscope, which affords a safe and efficient means of doing so Surgical treatment should, in their opinion, be restricted to those cases in which the bronchoscope has been tried and has failed. The bronchoscope is passed under local anasthesia, an injection of morphine and atropine having been given half-anhour before, any bleeding is controlled by the application of adrenalm. The bronchoscope is passed into the affected lung, and the tributary draining the abscess cavity is searched for, when found, a cannula is introduced and the pus evacuated by suction. The cavity is then washed out with normal saline followed by instillation of 25 per cent argyrol—(Medical Journal and Record, New York, October 2, 1929, p. 361.)

The Treatment of Suppurative Otilis Media

M. Yoel recommends, for the treatment of suppurative otitis media, whether acute or chronic, a series of injections of antistaphylococcic vaccine. This treatment has previously been employed for otitis externa, but not for otitis media. Dr. Yoel has successfully treated some thirty cases, but acknowledges that a

Practical Notes.

The Cerebi ospinal Fluid in the Diagnosis and Treatment of Inflammatory Diseases

Wells P Eagleton points out that the blood and cerebrospinal fluid systems are intimately related developmentally and surgically Infection enters the system by means of the veins in a considerable proportion of cases Infection of the anterior disternal lake by a retrograde thrombophlebitis from the throat causes immediate infection of the whole system On the other hand, infection which enters the posterior fossa is generally localized for a considerable period Rhinorrheea in traumatic cases is caused by proliferation of the nasal epithelium into the cleft and its junction with the endodural arachnoid, rhinorrhea is avoidable by short-circuiting the nasal epithelium Cerebrospinal fluid findings form but a small part in the diagnosis of suppurative diseases of the brain, they should always be considered in relation with the clinical picture Whenever there are numerous micro organisms free in the fluid the diagnosis is unfavourable, but even then the patient may recover if the other symptoms show that the cerebral tissue has not been destroyed The guiding principles in the interpreta-tion of abnormal fluid in suppurative lesions are (1) Increase of fluid signifies irritation, (2) the glucose content is consumed by micro-organisms, therefore its disappearance suggests that the infecting agent is active, (3) great reduction of the chloride content signifies the breaking down of the barrier between the blood circulation and the cerebrospinal fluid system, (4) increase in globulin signifies cellular degeneration, (5) free blood is due to operative trauma, but yellow fluid in acute suppurative lesions signifies profound toxomia with blood disorganization -(Journ Laryngol and Otol, October and November, 1929, pp 657 and 721)

The Radical Mastord Operation

R S Godsall discusses the need for a flap in the radical mastoid He points out that there were obvious disadvantages to the flap method and describes the technique of an operation which he had been performing for three years and in which no flap He used the normal external auditory canal without The ordinary incision was made and the canal cutting it away exposed, the external auditory meatus was protected The incision was extended down to the tympanic ring on its posterior and superior quadrants by means of pieces of gauze The canal was kept out of the field of operation by pledgets of gauze The operation was completed and extreme care was taken to destroy the Eustachian tube until white clear bone was seen on the whole of the inner wall, except in the region of the oval window One silkworm suture was passed through the whole thickness of tissue in the upper part of the posterior wound This stitch included the cut edges of perios teum and its object was to lift the whole ear upwards and backwards and to straighten the meatus Fine gauze was placed down the

PRACTICAL NOTES

The Operative Treatment of Ozæna

S Unterberger discusses the treatment of ozena and similar conditions in which shrinkage of the nasal cavities is brought about by autoplastic bone grafts He uses grafts from the ilium instead of the more usually employed ones from the tibia, as the former heal more rapidly, are easy to remove and the patient has less pain from the shal than from a tibial wound Dr Unterberger describes his method of removing the graft and transplanting it to the nose He claims that if his technique is followed the grafts will heal well without exception There is little damage to the mucous membrane of the nose, and only with careless handling of the mucous membrane or too tight plugging of the nasal cavities will necrosis of the graft The results of the method have been studied over a period of five years on seventy cases, out of which thirty-one were re-examined at regular intervals. The grafts failed in five cases In the other cases the results were as good as, if not better than in cases treated by older methods of bone grafting —(Zeitschrift für Hals, Nasen und Ohrenheillunde, 1929, Bd. 23, p 346)

The Relation of Deficiency Diet to Disease of the Nasal Sinuses.

L W Dean reviews the work done by Dr Amy Daniels and others on the relation of deficiency diet to disease of the nasal sinuses, and points out that while the absence of vitamins in the diet does not cause infection, vitamins and proper hygienic measures are important factors in the constant battle of the body against infection. It is the deficiency of vitamins plus something else that causes sinus infection. In the treatment of sinus infection a diet rich in vitamin A together with an increase in vitamin B is very essential. It does not, however, take the place of either the proper laryngological procedures or the observance of the usual hygienic regulations, the latter two things are equally important—(Annals of Otology, Rhinology, and Laryngology, St. Louis, September, 1929, p. 607.)

Foreign Bodies in the Oesophagus and Bronchi.

Van den Wildenberg and M Guns insist that, despite the reports published in medical journals by laryngologists, many practitioners do not think, when a case is before, them, of the possibility of a foreign body in the desophagus or bronch. The authors present 21 cases illustrating this assertion, and have previously published a further series of 132 cases. They point out the danger of attempting blindly to remove a foreign body from the desophagus or bronch. Organic foreign bodies (seeds, etc.) are more toxic than others. People who gulp their food should be warned of the danger of aspirating foreign matter into the bronchi. No one should go to sleep with a denture in the mouth—(Revue de Laryngologie, d'Otologie et de Rhinologie, October 15, 1929, p. 574.)

much larger number of cases must be treated before the method of treatment can be accepted as of general application. The first injection is usually half a cubic centimetre (in children one-tenth of a cubic centimetre), and the dose is then gradually increased up to two cubic centimetres, from six to twelve injections are usually given, but some cases received from eighteen to twenty-four injections—(Archives Internationales de Laryngologie, Otologie, Rhinologie et Broncho-Oesophagoscopie, March, 1929, p. 279)

Complications of Laryngectomy

J E MacKenty observes that as laryngectomy is in the majority of instances done on patients in the declining years of life and sometimes in the period of senility, all complications incident to this age may occur. In his series of about 300 cases, the surgical mortality between the ages of 75 and 81 (the oldest patient operated upon) has been about 50 per cent in a 3 per cent total mortality, it is evident that surgical death is rare in the younger patients. This 3 per cent mortality occurred almost entirely in patients over 63 Of all the miseries that beset us, says Dr. MacKenty, perhaps the most hopeless come from the indiscriminate use of radiation. After operation a dry gangrene attacks the whole radiated area, making hypopharyngeal closure impossible. Plastics fail in 100 per cent of cases. Pneumonia, the bugbear of the earlier operators, occurred only twice in the author's experience, the patients were very old and the termination was death. Mediastinitis has not occurred in the author's series, there were five cases of embolism, and one only of post-operative hæmorrhage.—(The Laryngoscope, St. Louis, October, 1929, p. 676.)

The Neurological Aspects of Nasal Sinus Infections

S L Ruskin points out that headaches and systemic disturbances are produced not only by suppurative conditions of the nasal sinuses, but by the irritation of the various nerve tracts long after the suppuration has run its course and stopped In these cases the inflammation has left a thickened mucous membrane which acts as a source of irritation to the nerve fibres supplying it. The X-rays show these conditions clearly Therapeutically, the cases are non-surgical and the patients usually receive but little care Treatment of the nasal (spheno-palatine) ganglion—by the applica-tion of cocaine to it or, if necessary, by the injection of alcohol into it—causes interception of the nerve pathway between the irritated mucosa and the nervous system, and thus the patient is freed from headaches and systemic disturbances. Once the nerve pathways are blocked, the thickened sinus membrane is of no further consequence to the patient —(Archives of Otolaryngology, Chicago, October, 1929, p 337)

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could not, namely, that the book contains the results of ten years' untiring inquiry, and he goes on to compare the methods employed by Mr Negus with those of Darwin and John Hunter, the reader is led to approach the book itself with eagerness to learn how such praise has been deserved. He does not have far to seek tables, which form one appendix, alone testify to the monumental work which Mr Negus has accomplished They contain a wealth of detailed information set out in tabular form By personal observation and experiment Mr Negus has traced the development of the larvax anatomically and physiologically from the lowest air breathing vertebrates, right through the animal kingdom up to man From his researches he has arrived at the conclusion that speech. or its equivalent vocal efforts in animals, is a purely subsidiary function of the larynx, its primary function was concerned with This new theory will inevitably arouse much discussion amongst those who have hitherto considered the human larynx purely as an organ of speech. The sections dealing with speech, and especially that on singing, should certainly interest those who teach elocution and singing, and, in spite of Mr Negus's assurance that good singers are born and not made, much useful and practical information can be culled from the chapters on the mechanism of phonation. The intelligent laity, as well as members of the medical profession, will find the book of great interest and its understanding not too difficult. Mr. Negus is to be congratulated on his achievement "The Mechanism of the Larynx" should become a classic—a prediction which can be made of few books in our tame

Tumours Arising from the Blood-vessels of the Brain Angiomatous Malformations and Hæmangioblastomas By Harvey Cushing, M.D., and Percival Bailey, M.D. Pp. 219, Figs. 159 London Bailhère, Tindall and Cox. 34s net

This monograph, replete with clinical, operative, and pathological detail according to the habit of Professor Cushing's school, is a fitting companion to its predecessors. It deals with a group of tumours to which the interests of neurological surgeons have recently been turning and gives minutely the authors' experience, though the rarrity of the lesions is shown by the proportion of 1 91 per cent in 1,522 verified intracranial tumours A pathological subdivision is made into two groups, the first including those tumours that they consider to be vascular malformations or angiomas, characterized by the presence of brain tissue between the component vessels, the second including those growths that are considered to be true neoplasms or hamangioblastomas, characterized by the presence of hæmangroblastic elements and the absence of brain tissue In the former group are to be found telangiectases and venous and arterial angiomas, among which the liability is noted of the venous to be associated with facial nævi, and of the arterial to result in exophthalmos and bruit with the onset of dilatation of the component vessels The varying histology of the latter group is discussed and the tendency to cyst formation is emphasized

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Reviews of Books.

The Nose, Throat, and Ear and their Diseases In original contributions by American and European authors, edited by Chevalier Jackson, MD, DSc, LLD, F.ACS, and G M Coates, AB, MD, FACS, assisted by Chevalier L Jackson, A.B, MD Pp 1177, 657 illustrations, and 27 inserts in colours London and Philadelphia W B Saunders Company, Ltd 60s net

This well-produced volume of nearly twelve hundred pages, freely illustrated, is a sort of oto-laryngological bouillabaisse-it provides a magnificent dish of mixed feeding. It is a matter for argument whether it is better for one man to write a textbook, or to have a large team of authors each writing on his own special subject under the general supervision of an editor Probably the latter method is the better, for no one man can write a textbook nowadays on such a wide subject as the diseases of the ear, nose and throat without having to provide at least some sections of it at second-hand It may be argued that it is, indeed, an advantage of such a book as this that conflicting opinions by leading authorities may be presented, and its very inconsistency may be accounted a virtue But if a team of over seventy, as in the present instance, is to produce a textbook, it seems to us that the editor or editors must keep a firmer hand upon them than Professor Jackson and Dr Coates have, with all their good qualities, been able to do or, apparently, have wished to do Nevertheless, with all its unevenness, the volume contains a vast amount of valuable information, and as a whole it is of high quality and reflects credit on its editors outstanding contributions are those by Professor Chevalier Jackson himself and his son on bronchoscopy and œsophagoscopy, by Sir StClair Thomson on cancer of the larynx and its surgical treatment, by Dr Milne Dickie on diseases of the middle ear, by Dr Wells P Eagleton on intracramal complications of aural suppuration, and by Dr Ross Faulkner on inflammatory affections of the nasal sinuses But it seems to show some lack of proportion to give so much as 32 pages to diseases of the external ear and 20 pages to prolapse of the laryngeal ventricle, though these sections are by well-known authorities Some of the articles are devoted to mere "stunts," such as tonsilloscopy, and some sections are frankly inadequate, such as those on cardiospasm and on Vincent's angina, neither of which includes recent and important work on the subject Taking it all in all, however, this book is one which every ear, nose and throat surgeon ought to possess, and which every medical practitioner would find extraordinarily interesting

The Mechanism of the Larynz By V E Negus, MS, FRCS, with an Introduction by Sir Arthur Keith, FRS London Wm Heinemann, Ltd Pp xxx + 528, with 160 figures and 15 tables 45s net

THE fact that Sir Arthur Keith has sponsored this book is sufficient guarantee that it must be of more than ordinary interest But when in his introduction he reveals that which the author



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The histological subdivision is accompanied by a clinical one in that the former group is found predominantly in the superior chamber, while the latter is found, the authors suggest, exclusively in the inferior Destructive criticism is levelled at the examples quoted from the literature of tumours diverging from this rule, but we think that the small number of tumours that even these authors have encountered renders unjustifiable the conclusion adumbrated on p 203 that the cerebellum is the exclusive seat of the second The twenty-five examples described with a wealth of detail repay a careful study, though we find it hard to enter into Dr Cushing's enthusiasm in the reproduction of photographs of healed wounds On the clinical side is noted the liability of the venous angiomas to result in Jacksonian epilepsy, the arterial tumours producing in addition bruit, increased extraoranial vasoularity and papilledema. Their common tendency to epilepsy predisposes both varieties to fatal terminal rupture during a seizure The clinical manifestations of the second group are said not to differ from those of cerebellar gliomas, save when in the rare Lindau's syndrome a retinal angioma is seen interesting, as in this country it is thought that the symptoms of such vascular growths are considerably less severe than those of other cerebellar tumours. The book is very well produced and printed, and its many illustrations are excellent

Clinical Methods A Guide to the Practical Study of Medicine By Robert Hutchison, M.D., F.R.C.P., and Donald Hunter, M.D., F.R.C.P. Ninth Edition, 1929 Foolscap 8vo, pp xiii and 684, 18 colour and 2 half-tone plates, 152 figures in the text London Cassell & Co., Ltd 12s 6d net

The place of the late Dr Harry Ramy of Edinburgh as a joint author has been taken in this edition by Dr Donald Hunter, a junior colleague of the senior editor at the London Hospital, with whose help it has been revised throughout. Originally published in 1897, this familiar and favourite handbook has been reprinted on thirty-one occasions, and has now attained its eighty-seventh thousand. In connection with this and as evidence of its wide popularity it is perhaps significant that the total number of medical practitioners on the British register was less than fifty-five thousand in 1928. The chief alterations in this edition will be found in the chapters on the nervous system, the examinations of pathological fluids, and bacteriological investigations, the last chapter having been rewritten by Dr G T Western of the London Hospital

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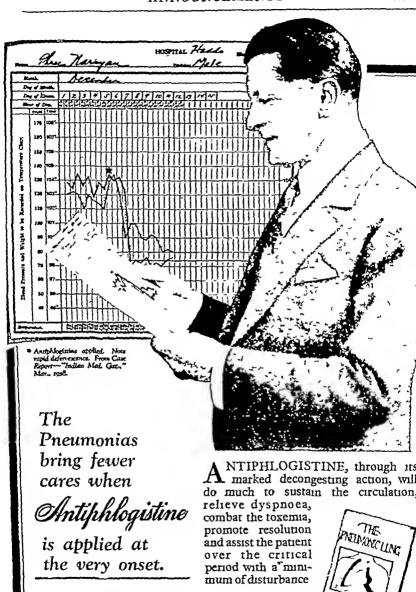
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- INGRAM, H VERNON, MB,
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- Macarthur, Lieut-Col W P, D50, OBE, MD., FRCPI Royal Army Medical Corps, Professor of Tropical Medicine, Royal Army Medical College, appointed Consulting Physician to the Brush Army from 10th December, 1974, in succession to Colonel J C kennedy (BF MD, k HP who is preceeding to India on duty
- MACKENZIE, J J R, MB, ChB EdIn, appointed Certifting Surgrout under the lactors and Workshop Acts at Kings Chiffe Northampton
- MASSEY, A. M. D. Leeds, D.P. H., appointed Medical Officer of Health for Coventry
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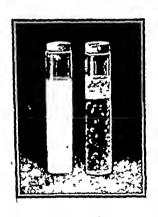
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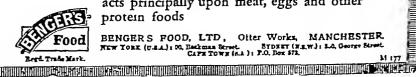
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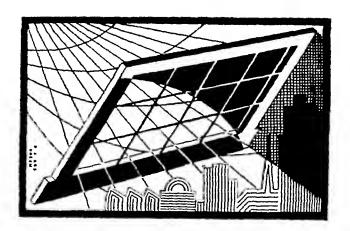
By A. A. BISSET, M.D. Harrogale

Editorial Notes.

Practical Notes. Reviews of Books.

Preparations and Inventions

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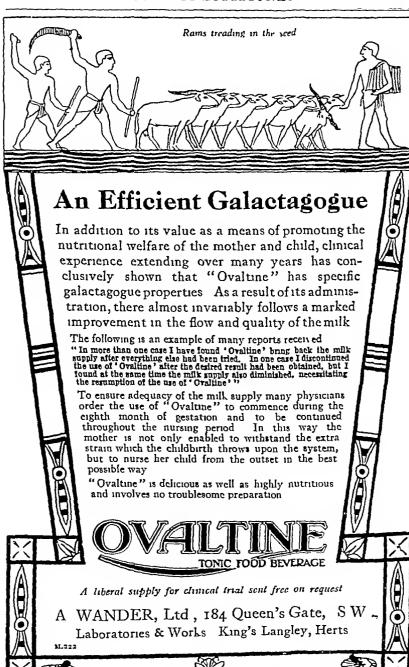
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FEBRUARY

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The Diagnosis of Chronic Colonic Obstructions.

By J P LOCKHART-MUMMERY, M.A., MB, FRCS

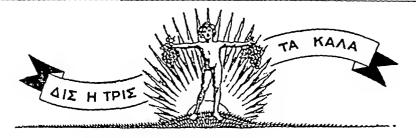
Senior Surgeon to St. Mark's Hospital, Consulting Surgeon, Queen's Hospital for Children, Honorary Surgeon, King Edward VII Hospital for Officers

WENTY-FIVE years ago no attempt was made to diagnose obstructive lesions of the colon until symptoms of acute obstruction had supervened The diseases of the large bowel were more or less of a mystery and their diagnosis was mostly pure Since then a great many aids to the diagnosis of conditions in the colon have been invented and perfected The accurate diagnosis of disease in the colon is still uncertain and open to great improvement, but modern methods have made it possible to recognize colonic lesions with considerable accuracy, and today the great majority of chronic obstructive lesions are diagnosed correctly long before the onset of acute symptoms This is a great advance and has entirely revolutionized the treatment of these conditions

The normal colon passes its contents along in about 16 to 17 hours. The residue of a normal meal taken by the mouth reaches the cæcum in approximately 4 hours, and takes another 16 or 17 hours to reach the rectum. There are, of course, considerable variations in different individuals and as the result of different

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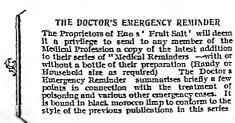


DIET AND CONSTIPATION

Though in all cases of intestinal atony the diet should be carefully considered, it has recently been pointed out by a distinguished physician attached to our largest hospital that "in spite of the general belief, not very much can be done by diet in the treatment of constipation, and the patient's mind should be disabused of the idea that there is any particular harm in taking a regular aperient, provided it is of the right kind"

It can confidently be claimed that Eno's "Fruit Salt" comes within this category, for it is an aperient which acts solely by retaining water in the bowel—as a result of its increased osmotic density—thus maintaining bulk and adequate pressure, and so promoting peristalsis

In contradistinction to most aperients, Enos "Fruit Salt" has no irritant or chemical effect on the mucous membrane—and accordingly produces no nausea or discomfort



also some of the alcohols, such as ether and chloroform

When, as the result of some lesion within or without the colon wall, the lumen is partly obstructed, the blood supply is restricted or the peristaltic muscle wave interfered with, certain definite alterations of Partial obstruction of the colon function occur lumen results in considerable delay in the passage of the fæcal content and in the slow accumulation of such content above the obstruction The first effect will be to increase the time which the fæcal material takes to pass through the colon and to produce what is generally called constipation, very soon, as the result of the irritation set up by the delayed contents above the obstruction and by the constant leakage of small quantities past the obstruction, the bowels begin to act with unnatural frequency and an irritative diarrhœa is set up, in spite of the fact that considerable delay in the passage through the colon is still taking place At the same time the decomposition of the delayed residue gives rise to distension of the gut with gas, especially above the obstruction partial obstruction these processes occur very slowly and often intermittently, depending on the quantity and quality of the food taken, and the measures used for the relief of symptoms

If the blood supply of the colon is restricted, as is the case in volvulus of the sigmoid and in mesenteric thrombosis, very rapid distension of the affected loop of colon takes place and later severe poisoning from the absorption of the decomposed contents through the damaged colon wall

When the peristaltic wave is interfered with by disease or injury the results are very similar to those caused by an obstruction of the lumen, but occur more slowly and distension is less evident. Marked hypertrophy of the muscular wall of the colon above the damaged area ultimately develops. As a rule, when

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food in the same individual. Excessive peristalsis may cause much more rapid emptying of the colon Among such causes may be mentioned. (1) The presence of a foreign body (2) Inflammation or any local irritative lesion (3) Certain drugs or foods, notably ergot (4) Excess of carbonic acid in the blood, this is well seen in the contraction occurring in the intestine in asphyxial conditions (5) Fear, extreme nervousness, or fright of any kind, will in some individuals cause immediate diarrhea This form of diarrhea was so common, as the result of air raids in London during the war, that it used to be called "air-raid diarrhea"

Causes of delay in the passage of the fæcal contents are (1) Obstruction of the lumen (2) Lowered vitality. (3) Dehydration of the tissues. (4) Damage to the nerve supply of the colon (5) Interference with the blood supply. (6) Certain drugs

Any condition which causes delay in the passage of

the colon contents will have certain definite consequences Fermentation, or decomposition, of the fæcal contents due to micro-organisms always occurs in the colon, but if there is delay the decomposition will become excessive and gas will form in large quantities and cause distension There is no doubt that the chief function of the colon is the absorption of water from its fæcal contents While this is not an important function to civilized man living in cities with an unlimited water supply, it is still of importance if long journeys have to be taken where water is scarce, and at one time must have been of vital importance A certain amount of digestion probably takes place in the cæcal end of the colon, but this does not appear to be very important Certain substances are excreted by the colon Patients whose colons have been removed are particularly susceptible to certain drugs, such as arsenic and mercury, and

CHRONIC COLONIC OBSTRUCTIONS

Careful inquiry will generally elicit the fact that the discomfort occurs some hours after meals Flatulence of a tiresome character is sometimes an early symptom. It may happen that the earliest symptom is a partial obstruction from fæcal impaction. Complete relief



Fig I.—X ray photograph of barium enema showing filling defect in lower pelvic colon due to carcinoma.

results from enemas or an aperient, and no further importance is attached to the happening, but one should always ask oneself why a healthy person should get an impaction, it does not occur in a normal bowel, except possibly in the aged Excess of mucus

disease affects the colon more than one of these factors are present at the same time

It is very obvious that if we are to diagnose obstructive lesions of the colon before the actual onset of obstructive symptoms we must be able to recognize the danger signals at a very early stage, so that further tests may be applied to confirm or allay our suspicions

A common early symptom is some slight irregularity of the bowel actions as compared with the patient's previous habit. Thus a patient who has been accustomed for many years to have one action of the bowels after breakfast may say that he now has to take an aperient fairly frequently and that his bowels act two or three times a day. Such irregularity may be only temporary, but may return again in a few weeks. These symptoms are probably due chiefly to irritation from the ulcerated surface and partly to interference with the normal muscular movement of the affected part of the bowel wall. It cannot be too strongly insisted upon that constipation alone is a very unusual early symptom.

Bleeding is sometimes an early symptom of cancer, and is due to the ulcer having perforated one of the small arteries in the bowel wall. When this happens the bleeding is quite profuse, several stools being passed consisting of nothing but blood. Hæmorrhage, however, only occurs as an early symptom in some 5 per cent of growths The blood is either quite bright in colour, or is in the form of large, partly changed clots, depending, of course, upon the time it has been retained within the colon It is, however, not digested, and in this contrasts with the appearance of blood coming from the stomach or duodenum recurring discomfort in the abdomen is a common symptom, but may not be referable to the colon, but rather to the stomach Thus the patient may complain of dyspeptic symptoms and loss of appetite

CHRONIC COLONIC OBSTRUCTIONS

early stage and when ulceration occurs small quantities of blood corpuscles must constantly find their way into the fæcal contents. The identification of occult blood in the stools of a patient suspected of having a cancer in the colon would be of the greatest value if it could be relied upon

The chief tests for small quantities of blood in the fæces are —

(1) Microscopic examination for red blood corpuscles (2) Chemical tests for occult blood. (3) Spectroscopic tests for blood pigment

In all cases in which a positive reaction to these blood tests is obtained when the patient is on a full diet, the test should be repeated after the patient has been on a vegetarian diet for three or four days. When judging the significance of a positive blood test the other sources of blood, such as non-malignant ulceration and internal piles, must be considered. The plan of taking a small piece of fæces with crocodile forceps from high up in the sigmoid through the sigmoidoscope is the method which should be adopted when practicable

A sigmoidoscope examination is of the greatest value. If the colon has previously been cleared it is possible to see well up into the pelvic colon. As the pelvic colon is the commonest situation for malignant growths of the bowel it will often enable a positive diagnosis to be made, as apart from actually seeing the growth a small portion can be removed with a suitable instrument and will enable a skilled histologist to identify the nature of the growth. Adhesions of the pelvic colon can also frequently be demonstrated by this means and the fixation of the colon which results from diverticulitis can be recognized in many cases. Mega-colon is also very readily diagnosed with the sigmoidoscope

Palpation of the abdomen and bimanual examination

in the stools may occur and has sometimes been the first symptom noticed

A marked degree of anæmia sometimes occurs in growths of the colon, more particularly at the cæcal end, and may be the first symptom noticed. The degree of anæmia may be such as to give rise to a diagnosis of lead poisoning or pernicious anæmia. No satisfactory explanation of this anæmia has yet been put forward. It always clears up after removal of the growth

Some often quoted symptoms are quite valueless, and may cause mistakes if any importance is attached to their presence; thus, loss of weight, cachexia and alteration in the shape of the stools can be present only in very advanced cases and are perfectly valueless as a means of diagnosis

It is obvious that all the symptoms enumerated are so comparatively insignificant, and so common in other and less important conditions, that it would be quite wrong to found a diagnosis upon them. They are none the less of great importance in that the presence of such symptoms should indicate the necessity for more detailed investigation to negative or confirm the diagnosis. It is only by attaching proper importance to these symptoms that we shall have an opportunity of utilizing more exact methods to arrive at a diagnosis

It was at one time thought that valuable results would be obtained by a careful examination of the stools in cases of suspected disease of the bowel, but it must be confessed that the results have been disappointing. The bacterial flora of the large bowel is so numerous and varies so greatly that it is hardly to be expected that any characteristic changes will be discoverable, in fact the results are very confusing and generally valueless

The only test of value is that for occult blood in the stools Cancers of the large bowel ulcerate at a very

CHRONIC COLONIC OBSTRUCTIONS

apparatus or special skill It consists in giving the patient a fairly large dose of charcoal (Carbonis ligni) with his or her breakfast and observing when the black colour of the stools is first observed A couple of teaspoonfuls of powdered charcoal in an ounce or

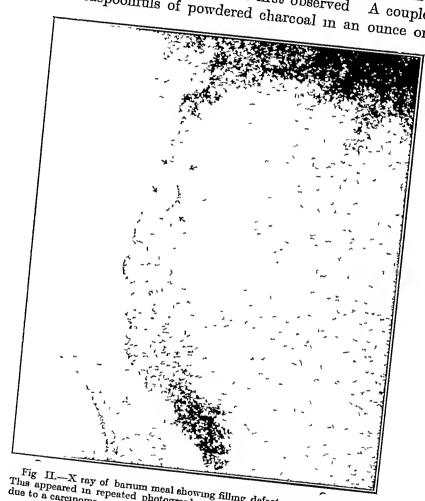


Fig II.—X ray of barrum meal showing filling defect in ascending colon This appeared in repeated photographs and at operation was found to be

two of milk is a convenient way of administering In a normal person the charcoal should appear in the stools the next morning, or at any rate the next day and should have almost disappeared the

of the pelvis with one finger in the rectum or vagina often affords most valuable information if carefully carried out. Tumours in the pelvic colon can often be felt in this way, but in other parts of the colon palpation will seldom enable a tumour to be felt unless it is a considerable size, as the colon is for the most part very deep-seated. Diverticulitis can often be recognized as there is generally marked tenderness over the site of the lesion, and rigidity, or an actual swelling, due to the surrounding inflammation. It need hardly be pointed out that palpation of a suspected case of diverticulitis must be carried out very carefully or harm may result.

One of the most valuable means of making a diagnosis at our disposal is a barium enema. A barium enema examination if carefully done will outline the whole colon and will very often demonstrate an early obstructive lesion. The examination should always be repeated at least once to avoid accidental appearances which are very hable to occur. A marked alteration in the normal outline of the colon, or the presence of a definite filling defect, if present in successive examinations, is of great value. When there is reason to suppose that spasm may be the cause of the appearance, the administration of atropine, or belladonna, before the administration of the enema will enable this source of fallacy to be overcome

Very satisfactory evidence of lesions in the colon can be obtained in this way, but there are very many fallacies. It is only when the photographs are taken with great care and repeated that one can rely upon the findings. Even when every care has been exercised we must remember that we are only photographing shadows and too much trust in them is unsafe.

The charcoal test which I suggested many years ago is a rough, but sometimes useful guide, which can be very readily used, and does not necessitate any

diverticula under the rays is very characteristic, more especially if the photograph is taken after the evacuation of the enema has removed the shadow of the bowel lumen

In cases of volvulus and mega-colon, X-ray examinations give valuable information as to the cause and extent of the lesion. In cases of adhesions and obstruction by bands, X-rays are a decided help, but the photographs are much more difficult to interpret.

Indications for Operation —When a growth is diagnosed, or even suspected, there is, of course, no question as to the correct procedure. An operation with the object of freely resecting that portion of colon containing the lesion affords the only hope of saving the patient's life. The results of resection of the colon for cancer, apart from growths at the lower end of the pelvic colon, are among the best that surgery has to show in the treatment of this dreadful disease. When resection and end-to-end anastomosis can be performed the restoration of function is perfect, and the patient is left without any disability. Further, the liability to recurrence is very slight as compared with cancer in most other situations.

The commonest obstructive lesion of the colon, however, is not cancer but diverticulitis. This condition until lately used to be considered rare, but it is now very obvious that it occurs with much greater frequency than was previously supposed. The question of when to operate and what to do in these cases is surrounded with difficulties. The patients are usually elderly and often very stout, and by no means ideal subjects for laparotomy. On the other hand a well-established diverticulities is not curable apart from operation, although the patients can often be considerably relieved, and if proper care is taken prevented from having attacks even for years. Acute attacks are attended with considerable danger.

following day. Slight variation of this may be discounted, but if two or three days elapse before the appearance of the charcoal, and if it continues to appear for several days afterwards it is clear that there is abnormal delay in the passage of the colonic contents, which requires further investigation

None of the methods mentioned of making a diagnosis can be relied upon solely with any degree of certainty in making a diagnosis of a growth in the colon, but if, after a careful consideration of all the evidence thus accumulated, there is a reasonable probability that a growth is present, then we must be prepared to err, if at all, on the side of safety and advise an operation. It is obviously much better to do an unnecessary operation, than to miss a lesion which may ultimately cost the patient his life.

The greatest difficulty arises in diagnosing cases of early carcinoma of the colon by the X-rays. Negative results, that is to say, failure to find a filling defect or abnormal points of outline in the colon, cannot be taken as proving that there is no growth present I have on many occasions found growths in patients who had been assured on such X-ray evidence that nothing was there The filling defect, if present, will often have a double outline if due to a cancerous ulcer, as the greatest narrowing occurs at the upper and lower edges of the ulcer. If the growth is of the papillomatous variety and projects markedly into the bowel lumen the filling defect will tend to have a curved outline with the concavity of the curve towards the growth A distinct and well-marked notch in the wall of the colon with some fivation of the wall may be all that is seen in some cases

In cases of diverticulitis the X-rays enable a positive diagnosis to be made with ease and certainty, providing the photographs are well enough taken, with a first-class apparatus The appearance of the

CHRONIC COLONIC OBSTRUCTIONS

I have two children aged between two and three with well marked mega-colon, whom I am treating with belladonna and daily enemata, and both have greatly improved. I am hoping that if the treatment is carried out carefully the colon may resume a normal state, but that remains to be seen

Volvulus of the sigmoid or cæcal angle is fortunately rare. It used not to be detected until a complete and sudden obstruction had occurred, but thanks to the X-rays we can often detect such cases now.

I was recently asked to see a little girl aged 12 who ever since birth had suffered severely from constipation and who got severe abdominal pain before any action of the bowels There was also a tendency to distension of the abdomen On examining the rectum no cause could be discovered The patient, however, was very tender on pressure on the left side of the pelvis, both from the rectum and from the abdomen An X-ray photograph showed a very much enlarged and dilated sigmoid colon I operated on the child and found a large chronic volvulus of the pelvic colon One could see quite easily the place where the colon twisted upon itself I shortened the pelvic mesentery with a series of statches in such a way that the colon could not twist any more and she was quite cured of all her symptoms

If successful results are to be obtained in the treatment of chronic obstructive lesions of the colon, early diagnosis is essential and this is only possible if the earliest, often vague, symptoms are recognized and proper means taken to confirm or negative the presence of a lesion in the bowel. Actual acute obstruction seldom occurs without some previous warning and this warning should never be overlooked

foration may occur into the bladder, abscesses may form in the abdominal cavity and a serious degree of stricture of the bowel may develop. If cases are left unoperated upon too long, little can be done beyond the establishment of a colostomy opening, which will most probably be permanent. Like so many other forms of disease carly operation offers the best chance of a cure. The ideal treatment is resection of the damaged bowel. I have done this a good many times, but it is only in a few cases that this is possible, more frequently the damaged bowel is too fixed, or there is too little healthy bowel below to allow of successful resection.

Much may often be done by division of adhesions and wrapping the affected bowel in omentum or omental grafts, and occasionally a short-circuit can be carried out successfully. When extensive abscesses have formed, interference with the local condition, apart from drainage of abscesses, is impossible, and too often this is the stage at which the surgeon is called in. A colostomy above the site of trouble is the only possible treatment.

Congenital mega-colon is one of the most curious forms of chronic obstruction and but little is yet known about the morbid physiology of the condition. There is no actual obstruction of the lumen, on the other hand the bowel is enormously enlarged both in diameter and in the thickness of the bowel wall. I saw a patient just recently who had on several occasions gone a whole month without any action of the bowels, and a few years ago I had a woman in St. Mark's Hospital who had been three months without any bowel relief. Aperients in such cases are quite useless, and sedatives such as belladonna are the only drugs that will give relief combined with repeated enemas. Surgical treatment is seldom possible in such cases. At the present time

CHRONIC COLONIC OBSTRUCTIONS

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The Etiology of Epidemic Encephalitis.

By RENÉ CRUCHET, MD

Professor of Medicine at the University of Bordeaux

HE etiology of epidemic encephalitis has recently received renewed attention in the medical press, particularly by British authors. One factor appears to be definitely established, namely, the important part played by the Great War of 1914–1918 in the causation of this affection.

The first authors to describe the condition indicated the simultaneous appearance of the disease in Austria (Economo), and in France (Cruchet, Moutier and Calmettes), towards the end of 1916 and the beginning of 1917. As a matter of fact, the Austrian epidemic was so localized, and comprised such a small number of cases that it cannot be considered as the original focus of the disease. It is more likely that it was imported into Vienna from elsewhere, but the question is whence? The more closely the facts are scrutinized the more support is found for the view that this disease originated on the French front about September, 1915—a view which is upheld in particular by Maximilian Pfister. This author obviously bases his deductions on the points made in my recent book.

The first cases at Commercy and Verdun—I had observed the frequent incidence of a form of encephalo-myelitis distinct from those previously recognized at Commercy during the last three months of 1915, and at Verdun from December, 1915, to the end of February, 1916 As senior medical officer in the army under the command of Medical Inspector-General Lemoinc, cases of

nervous and mental disease were referred to me from these two towns Among 47 such cases at Commercy, I had been particularly struck by In both of these a polymorphic delirium, the sequel of typhoid, had persisted beyond the convalescent stage of the fever A careful examination caused me to doubt the existence of a true typhoid fever; the condition was rather that of a febrile state, irregular in its progress, and accompanied by confusional phenomena suggesting rather dementia præcox. As laboratory investigation of the cerebrospinal fluid could not be carried out it was impossible to be certain, but my interest had been aroused by these isolated facts which I could not classify in any known pathological category However, when I compare these observations to-day with subsequent analagous cases of undoubted encephalo-myclitis, it is obvious that my views were justified My first impressions were strengthened during my work at Verdun, where I remained for two months, from December, 1915, to February, 1916 In this period 161 cases were examined in my neuro-psychiatric clinic, and of these five elicited my particular Here again nervous and mental pheattention nomena predominated, often associated with febrile symptoms, suggesting the typhoid state

In one case the notable features were somnolence, headache and defective memory, the fever defervesced, but there remained a right hemi-paresis with inferior paralysis of the same side, difficulty of speech, mental hebetude and unequal pupils

In another case, the fever and the intestinal condition were such that a blood culture and a sero diagnostic test were made, the results, however, were negative, so that typhoid could be ruled Nevertheless, the diseased condition of the mid-brain dominated the picture unequal pupils, tremor of the tongue, uncertainty of speech and gait. In walking, the patient threw his trunk backwards, and without support would have fallen. He complained of disordered vision, on examination the fundus oculi in both eyes was normal, but the eye-balls showed definite characteristic clonic movements

A third case developed symptoms of mental deficiency approaching

dementia, following an initial influenzal fever

In the last two of the cases, fever was absent, but the signs of diffuse encephalo-myelitis were obvious. One exhibited difficulty in speech and uncertain gait, persistent headache, brisk pronation and supination reflexes, right-sided adiadokokinesia, frembling script, and clumsiness in the fine movements of the right hand (picking up a coin or a pin). There were slight attacks of bulbar asphyxia on several occasions. In the other case, a young man hitherto healthy, epileptic attacks had occurred over a period of three months, with progressive mental deterioration. The facial expression was vacant, speech was laboured, and the gait slightly inco-ordinated.

Of course these various observations, made both at Commercy and Verdun, were too undetermined to enable me to classify them as a new disease, but, nevertheless, from the clinical standpoint alone, they sufficed to draw my attention to phenomena which were unquestionably novel No neurologist could have been deceived on that point, as these phenomena definitely could not be placed in any accepted classification of mental disease. Having given full consideration, in succession, to syphilis, the nervous reactions to typhoid and influenza, the group of dementias and in particular dementia piæcox, these signs and symptoms called for serious discussion They could no more be explained as types of meningitis, of whatever causal form, than they could by hæmorrhage or softening, cerebral tumour, or central nervous disturbance due to diabetes or uranua As regards intoxications, if this were a possible explanation, there is not any known toxin with this action

As a matter of fact there was only one condition which seemed to have any relation to the symptoms observed, namely, Medin's disease—an affection which has been fully studied in the northern latitudes. But here again the cases did not run the usual course of this particular form of poho-encephalitis, with its violent beginning, pyrexia, vomiting, severe pain, the widespread paralytic involvement eventually

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circumscribed to certain groups of muscles, and the consecutive more or less general atrophy

I take no great credit for forming this opinion, as I had been a pupil of, and was, later, assistant to Professor Pitres, the great French neurologist and former collaborator with Charcot Further, as interne and assistant to Professor Moussous, at the Children's Chinc of Bordeaux University, I had in the course of many years become familiar with the various types of poliomyelitis and polioencephalitis, which are of such frequent occurrence in childhood And the observations made at the front with the French armies did not fall into line with any of them

The Forty Cases at Bar-le-Duc—It was my first care, on arriving at the General Hospital of Bar-le-Duc in April, 1916, to look out for cases analagous to those observed in Commercy and Verdun.

Thus I was enabled a year later, in April, 1917, to make a communication to the Société Médicale des Hôpitaux des Paris on "40 cases of subacute encephalomyelitis," with the collaboration of F. Moutier and A. Calmettes This was the first official description of the disease which was afterwards called encephalitis lethargica, subsequently epidenic encephalitis, encephalomyelitis, neuraxitis and finally "Cruchet's disease."

CLINICAL TYPES

As the polymorphous character of this new disease was its most striking feature, we classified it according to the following chinical types —

(1) Mental types—The majority of observations made on this group show mental troubles referred chiefly to the memory and the intelligence, but without revealing abnormal sub-arachnoid reactions. Hebetude, sluggishness and somnolence were fairly frequently noted. It is worthy of record, too, that a definite, though undetermined, infective state was

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revealed, accompanied by febrile reaction to a greater or less degree, delirium, fatigue, limpness and apathy General anti-infectious treatment always caused improvement in the patients, some of whom appeared mask-like, with a slowness of action and thought, sometimes accompanied by trembling symptoms which obviously belong to the epidemic encephalo-myelitis group.

- (2) Meningo-encephalitic types.—These, even more than the mental types, resemble the classical forms of encephalo-myelitis They are characterized by initial fever with rhythmic clonic spasms, visual involvement with ptosis, unequal pupils, cerebral torpor, mask-like face, slow evolution, fine tremors of the extremities, physical and mental langour. Bradykinesia is clearly evident in all the movements, even in the speech, and crises of lethargy are also observed. The variability of the cerebro-spinal fluid findings is also worthy of In five cases out of eight, albumin, often in high percentage, was present, while the cytological reaction was sometimes of a polynuclear nature and sometimes—more frequently—showed a lymphocytosis But these reactions rapidly diminished in two of the In the three other cases out of the eight under consideration, the sub-arachnoid reactions were negative, although the symptomatic appearances were identical
- (3) Convulsive types -These types are characterized by crises of an epileptiform or epileptic nature, and commence at a later age in subjects hitherto unaffected. What gives these phenomena a special significance is that they are intercurrent in the course of an infection of which the symptoms, although varied, are very similar to those we have just described. Further, is it not possible, as far as we can tell in our present state of knowledge, that epidemic encephalo-myelitis, may manifest itself in convulsions, even in epileptic

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seizures?

(4) Chorese types—These cases are marked by a high temperature of 41° C (106° F.), accompanied by acute maniacal excitement, with fibrillary and myoclonic spasms, in the severe forms coma supervenes, and death is due to cardiac collapse and asphyxia. In the milder forms the movements may take the character of a true chorea, although of excessive virulence. The course of the disease is prolonged, convalescence interminable and cure possible, but followed by a state of fatigue and asthenia which persists indefinitely.

These types may justifiably be compared to Dubini's chorea, and it has been shown, correctly, that in the majority of these cases there was no question of chorea proper. The term myocloma has even been proposed. As a matter of fact, this question has been settled since 1907. I demonstrated in my "Treatise on Spasmodic Torticollis" that Dubini's chorea was not true chorea. Even at that time I defined it tentatively as "a disease of the nervous centres, of sudden onset, with sudden clonic convulsive symptoms, progressing rapidly to a usually fatal termination" I had emphasized the rhythmic character of the convulsions, and had classified them as "acute rhythmias" of toxi-infectious origin, which I first described and to which I attached a grave prognosis I had also shown that in the so-called chorea of Dubini the clonic spasms were not always rhythmical. they might be "airhythmic," but in that case they differed in no way from the various spasmodic reactions accompanying acute cerebro-spinal affections 3

These types, described as choreic, which were encountered at the beginning of 1917 in the course of my observations on encephalo-myelitis, presented, therefore, no novel features. They simply confirmed a clinical conception I had come to ten years previously.

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The only point of real interest—and, indeed, it is of the first importance—was that they furnished a further proof of the polymorphism of encephalomyelitis—a polymorphism completely misunderstood by all authors in the early history of encephalitis.

- (5) Hemiplegic Types.—It is impossible to overlook the peculiar characteristics of these hemiplegias The ages of the patients being from 20 to 40 years, one's first thought is syphilis, especially when the retro-gressive and favourable course of the condition is considered. But the antecedents, as well as the Bordet-Wassermann reaction, are negative, and the examination of the cerebro-spinal fluid is normal. Also, it is to be noted that the onset is almost always febrile, with somnolence, headache, muscular weakness and general fatigue Disordered vision was observed in several cases, particularly diplopia. Furthermore, the lesions seem to be fairly diffuse and to be located variously; sometimes they cause an ictus, and, on the other hand, there may be spasmodic reactions recalling Jacksonian epilepsy, disturbance of speech and dysarthma may alternate with signs of hyperæsthesia or complete anæsthesia a sequel, even though these hemiplegic symptoms disappear or diminish to a great extent, the patients remain infirm, subnormal, impotent, lethargic and mask-like It would seem difficult, in such circumstances, not to think of an encephalo-myelitic origin
- (6) Ponto-cerebellar types—These types may be confused with encephalitis lethargica proper. These are characterized by a febrile state, pupillary disturbances, amblyopia, palpebral ptosis, strabismus and more or less profound intellectual torpor. The nerve centres adjacent to the oculo-motors are frequently involved, particularly those of the vagus. The infective process extends to the cerebellum by the pyramidal tract. Finally, I have noted an evolution

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towards the bradykmetic syndrome, as I have called it, or post-encephalitic parkinsonism. On this point one of my observations is very illustrative. It is mentioned in my published lectures, which I gave in conjunction with Henri Verger 4. Going back to 1916, it gives an irrefutable proof of the encephalitic origin of the parkinsonian or bradykinetic state ultimately exhibited by the patient whose actual condition remains stationary

(7) Bulbo-pontine types.—After an infective onset of influenzal character, localization takes place in the grey nuclei of the mid-brain, with ptosis, diplopia, trismus, facial paralysis, alternate facial hemispasm, hemiatrophy of the tongue, trigeminal neuralgia and vaso-motor reactions of the face. It is in this group that one of the most remarkable cases in our series is to be found

After an influenzal onset, the patient showed a complete paralysis of the left arm, then the fulminating evolution followed the type of Landry's ascending paralysis, irregular dyspicea, intermittent cardiac action, paralysis of the diaphragm and intercostal muscles, and death from asphyxia

This case, occurring in 1917, was histologically examined at the time by Dr Anglade, and the lesions he found were absolutely typical. Although that author has since had the opportunity of examining a large number of specimens from encephalomyelitic cases, he himself admits that he has never been able to add to his first description in 1917. When I read my communication before the Royal Society of Medicine in London, in February, 1925, many of Dr. Anglade's original preparations, among them this work done in 1917, were shown.

(8) Medullary types—The existence of medullary types, although they are less frequent than the preceding types, appears to us indisputable. It is true that for the most part they are a complication or an extension of encephalitis, but they can occur

as a separate entity.

In the anterior type, a febrile onset with somnolence and muscular atony is followed by pains in the muscle groups, with subsequent fibrillary contractions of a myoclonic type and abolition of the pronation and supmation reflexes. Flaccid paralysis then sets in, atrophy, a diminution of muscular contractibility to faradic or galvanic stimuli, without the reaction of degeneration. In most cases there is a recuperation of movement, but it is generally slow, with more or less extensive atrophy

In the posterior type the picture is dominated by painful phenomena of a more or less radicular character, although it does not approach the fulminating type. The reflexes are diminished or normal, hyperæsthesia occasionally occurs, along with genital excitability, erections and some disturbance of the sphincters. A lymp-ocytosis of the cerebio-spinal fluid is sometimes found; the albumin may be slightly increased. But this posterior type is very often complicated by the lateral and spasmodic type, or is associated with it. In such case it is the pyramidal phenomena which are the most obvious—spastic gait, exaggeration of the reflexes, tremors, etc.

In all these various cases, whatever the medullary involvement may be, certain signs in the onset or in the course of their evolution, (such as somnolence, apathy, visual disturbances, retarded ideation, febrile state) permit us to classify them as epidemic encephalitis.

(9) Polyneuritic types.—In this group we have classified a few cases resembling the classical type of polyneuritis, with the exception of our case of acute ataxia. But closer study of these observations, and of others which we had the opportunity of making subsequently, we formed the conviction that the polyneuritic types were (as the majority of these types)

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almost always disguised medullary types 6

THE POLYMORPHIC CHARACTER OF EPIDEMIC ENCEPHALITIS

By observations collated in this way, extending over the period from 1915 to 1917, one can see that there is nothing missing in the description of epidemic encephalitis in its accepted classification to-day. The infective onset, the various clinical forms, the evolution and the termination with diverse sequelæ, especially the post-encephalitic Parkinsonism, the pathological anatomy with histological details—all this is definitely set out beyond any possible ambiguity.

The conception of encephalitis, so-called lethargic, formulated by Economo in 1917, and restated by Netter and various other authors in 1918, misdirected attention for a time towards a completely specialized type of the disease. For Economo, encephalitis lethargica is essentially a polio-encephalitis, localized principally in the grey matter of the mid-brain, as revealed by his first official publication in the Wiener klinische Wochenschrift (No 19, May 10, 1917), entitled "Encephalitis lethargica" A literal translation is as follows—

"We are dealing with a sort of sleepy sickness, varying from a simple desire to sleep to the most profound stupor and coma. Among the chief symptoms is involvement of the ocular muscles. There is a slight palpebral ptosis, which is not simply due to the physiological effect of somnolence, but is a true paralytic ptosis, often associated with total or partial paralysis of the other branches of the oculomotor nerve (p. 581)". The chief symptom of this disease is the patient's sleepiness—which Economo compares with a similar epidemic described by Cameranius in 1712 (p. 583). In conclusion he states: "We believe that this encephalitis, of epi-

as a separate entity

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district, as it may have occurred unnoticed elsewhere. Nevertheless, until further information accrues, it must be admitted that the first focus to be traced was in this portion of the front It then spread to the larger sector of Bar-le-Duc, and later, cases were observed among various army divisions, including the English, and also behind the front Indeed, in 1916, Jean Lépine (Lyons) and Etienne (Nancy) observed analogous cases in subjects hailing for the most part from the army zones At the same period a female patient was seen by Netter, but the diagnosis was not made until later, retrospectively. This patient, examined near Paris, at Bagnolet, had been infected at Royat, now Royat at that time was admitting many wounded soldiers from the front who very probably had brought the disease with them undiagnosed Arthur J Hall records a very illustrative case-

A soldier, aged 37, became ill on the British front in June, 1916, and was sent to a Sheffield hospital—It was not until two years later, however, that Hall was struck by his characteristic mask-like attitude and demeanour, with right-sided semi-tremors At the time he looked on it as an "atypical" paralysis agitans, and it was not until encephalitis had become more generally known that the case was diagnosed as such—The photograph of this soldier, reproduced in Hall's book, shows the typical signs of post-encephalitic Parkinsonisms

Identical cases have since been noted among discharged soldiers, in whom the encephalitic origin of the disease was only recognized retrospectively. Cases of the Parkinsonian syndrome have often been traced to their origin to 1916, even to 1915, although they were only diagnosed much later, a point brought out in the thesis of pupil Edouaid Castets⁹

Several of the patients came from the Orient, but they had previously been in action on the French front The same remark also applies to the cases reported in Morocco None was observed before June—July 1917, when Dr Spéder discovered an oculo-lethargic type, with tremor and pains, in a young Jew, aged 18 It was

demic incidence, is, from its characteristic symptom, a sleepy sickness (Schlummersucht)"

This conception of encephalitis is much too narrow I have always held that Economo's encephalitis leth-argica was only one of the types of sub-acute or diffuse encephalo-mychtis, such as we described in April, 1917, based on observations made since 1915 Little by little, the evolution of the conception has veered towards the polymorphic character of this new morbid entity that I was the first to uphold, and which is to-day the universally adopted doctrine. Hence my right of priority appears to be beyond question—as was recognized by Arthur J. Hall in 1924, and again in a recent editorial of the British Medical Journal of March 2, 1929 (p. 407)⁷ So there are legitimate grounds for the designation of "Cruchet's disease" already in use in Spain, Czecho-Slovakia, and France These claims are substantiated by Euzière and Pagès, Ch Achard, Ramond, J Castaigne, Etienne, H Roger and others

THE SPREAD OF EPIDEMIC ENCEPHALITIS.

The facts which I have here set down are of interest in that they show that the first cases of epidemic encephalitis, observed in 1915, occurred among the French troops. One might think that these cases of encephalomyelitis were confined exclusively to the north-eastern zone of the armies under my neurological supervision, where the patients were referred to the special treatment centres at Commercy, Verdun, and, later, Bar-le-Duc. But it must not be forgotten that the troops were frequently changed from sector to sector, and it is a matter of considerable difficulty to say in what sector the disease first manifested itself.

The fact that the first cases were observed after 1915 in the neighbourhood of Commercy and Verdun is no absolute proof that the disease originated in this

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back the encephalitic virus which was observed at this time among the soldiers under my care

CONCLUSIONS

This view is all the more tenable in that it conforms to our previous observation, made in 1920, when we studied the course of epidemic encephalo-myelitis in Bordeaux and the neighbouring regions On the basis of a total of 145 cases observed at this period we came to the conclusion that the epidemic "had been imported into the South-western district of France by soldiers attached to the army groups where it had already existed in 1915-16 and 1916-17"11 As far as France, Europe and distant lands are concerned, the true explanation of the origin of the disease must be as follows Epidemic encephalitis arose in the combatant zone of the French armies during the year 1915, and in particular in the sectors of Commercy and Verdun

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not until after 1918 that the incidence increased, either among the native population or among the Europeans, and then the chief localities affected were the Moroccan ports, Casablanca, Mazagan, Saffi and Mogador.

These facts tend to prove that encephalitis was imported by the troops of occupation, the majority of whom had served previously on the French front. Pujol (Casablanca) says that it is from Europe, that is to say France, that the virus was imported, and I am entirely in agreement with him 10 The same question of origin can be applied to the patients seen by Economo in Austria in 1917, and in Australia about the same date Surely encephalitis had been imported into those countries by soldiers returning from the front? This view seems all the more likely since it has been borne out in other distant lands, such as China Maximilian O. Pfister, on serious consideration, holds that Watson's hypothesis in quoting an isolated case of encephalitis in Yunnam in 1915 cannot be maintained. The first cases of encephalitis did not actually appear in China until 1919, and since then the disease has spread through the country, following the most frequented lines of communication.

From his own researches, Pfister comes to the conclusion that it was the Indo-Chinese soldiers engaged around Verdun in 1915 (where the first cases of encephalitis occurred), who imported the disease into Annam when, in the same year, they returned home From Indo-China the disease spread into China along the commercial routes, the ports and the important towns in communication with Europe Pfister's conclusions are based on irrefutable facts, because the Annamite troops were certainly utilized in 1915 for important road-making work in the neighbourhood of Verdun, and their repatriation began in the autumn of the same year. There is, therefore, nothing extraordinary in the view that they should have carried

of fat, while, at the other extreme, there are those who state that if the ration of fat be kept low the amount of carbohydrate given need not be reduced very much below the normal average. Success has followed both methods, but it is probable that greater successes would have been recorded if some patients had been treated by one method and others by the other. This was impressed upon me very forcibly about a dozen years ago when Allen's treatment with restricted diet was the most successful known.

I had found that a young woman under my care could be kept free from glycosuria when she was on a diet consisting of 90 grams of carbohydrate, 60 grams of protein and 70 grams of fat She weighed a little under seven stone and was able to maintain her weight and earn a living whilst on this meagre diet, any increase in the quantity of fat led to the return of glycosuria. After leaving my care she developed a cold, glycosuria returned, and she sought the advice of her local practitioner who, on learning that she was taking the equivalent of four and a-half ounces of bread advised her to reduce the amount of carbohydrate in her diet and to add to the fat She followed that advice and returned to me some months later on a diet of 10 grams of carbohydrate, 60 grams of protein and 115 grams of fat, with a very definite glycosuma The energy value of this diet was about the same as that which she had been having when she left my care I found that the infection had reduced her tolerance a small amount and that she was free from glycosuma when she adhered to a duet of 80 grams of carbohydrate, 60 grams of protein, and 70 grams of fat

Since that time I have met with some number of patients who are able to utilize more carbohydrate than fat, but in my experience they are in the minority Since the introduction of insulin there has been a tendency to use standard diets, to determine the amount of energy required in the food by a patient by weighing him and measuring his height and then referring to a table based upon averages. The average is very rarely the optimum for the individual

Not only is the energy of the food often based upon tables, but also upon the ratio of the total carbohydrate to the fat Many assume that so long as the fat does not exceed two and a-half times the total carbohydrate, ketosis will not occur. In my opinion

The Treatment of Diabetes Mellitus.

By O LEYTON, MA, DSc, MD, FRCP Physician to the London Hospital

HE object of this article is to induce others to try the method advocated, because a certain number of my patients have recovered from diabetes mellitus In 1916 a very senior colleague said to me "I wanted to demonstrate to my clerks the method of detecting sugar in the urine, and there were no cases of diabetes mellitus under my care; half a dozen patients labelled with that disease were in your beds, but none of them has sugar in the urine How is it done?" When my reply had occupied fifteen seconds it was cut "That is no use to me, if it had been something which I could have ordered t ds I should have liked to try it, but these complicated things must be left to the younger men"

During the intervening fourteen years, treatment has become more and more complicated. This has, perhaps, been the reason for attempts having been made to standardize treatments, but since two normal healthy individuals may possess metabolisms very far from identical, it is easy to understand that a standard method of treatment of all patients suffering from a disease will not lead to the most successful results.

The study of the many books devoted to the treatment of diabetes mellitus is of no little interest, the methods advocated differ enormously. Some advise diets very poor in carbohydrates and huge quantities

DIABETES MELLITUS

the arbitrary concentration 0 15 per cent

The next question is which cases of diabetes mellitus should be submitted to this treatment. Crile writes in his book on diseases of the thyroid gland that the definite diagnosis of hyperthyroidism is the indication for partial thyroidectomy. No physician would contradict this provided he was certain that the mortality from the operation was as low as it is in the hands of Crile, namely, in the region of one per cent. The indication for treatment with insulin is the establishment of a definite diagnosis of diabetes mellitus. The mortality from insulin is less than 0 01 per cent

It may be argued that this advice is absurd because there are hundreds of thousands of patients suffering from diabetes mellitus who live long and happily, with the disease controlled by a restricted diet Although sharing this view a few years ago, I now think that the majority of these cases are not suffering from diabetes mellitus but from a condition which might be termed stationary hyperglycæmic glycosuria These cases never complain of thirst, polyuria, lack of energy and loss of weight The glycosuria has been discovered either when a routine examination has been carried out for the purpose of effecting a life insurance, or by some commercial firm before engaging the patient or when the patient has consulted a physician for some symptom, such as neuritis, and hyperglycæmia has been found The neuritis may, however, have been alcoholic, or due to some bacterial toxin and not necessarily hyperglycæmic in origin.

In the absence of symptoms the diagnosis of diabetes mellitus is not a very simple matter. There is ample evidence that the so-called sugar tolerance test may doom a hapless individual to a restricted diet for the rest of his life, whereas he would enjoy better health if he were allowed to eat whatever he liked. I am not acquainted with any Jook which describes a

it is much wiser to test the urine and the blood for ketones rather than to rely upon that ratio. There is one rule only, which I apply to all patients, admittedly it is arbitrary and probably it will be improved upon in the near future, but at the moment I do not know any method of making it more elastic. The rule is to arrange the treatment so that the concentration of sugar in the blood shall not rise above 0.15 per cent at any time, day or night. This rule has as its basis, observations which date back before insuling entered into the treatment of diabetes mellitus. Many of us found then that the only hope of increasing the food tolerance of patients suffering from diabetes mellitus was by resting the pancreas and keeping the sugar in the blood at a low level.

The rules of treatment which I have formulated are as follows:—

- (1) A duet which satisfies the appetite of the patient and which the patient is willing to adhere to indefinitely.
- (2) This diet must supply sufficient energy to maintain the weight of the patient provided he is not too fat
 - (3) The diet must keep him free from ketosis.
 - (4) This diet can be arrived at by trial
- (5) Doses of insulin of sufficient magnitude and frequency to maintain the concentration of sugar in the blood below 0 15 per cent at all times.

The mechanism through which the pancreas is stimulated is still a subject for debate, but all are agreed that however it is brought about the concentration of sugar in the blood is the determining factor. Probably the concentration of sugar in the blood necessary to stimulate the pancreas differs in different individuals, but at present there is no rehable method of finding out what it is and therefore I have adopted

DIABETES MELLITUS

daily carbohydrate is given at breakfast and threeeighths at the evening meal, the remainder is distributed between lunch and tea. The object of giving more carbohydrate in the evening than in the morning is to make it more probable that if hypoglycæmia occurs it will be about midday rather than toward

midnight

It is my custom to advise the practitioner to begin with the administration of five units of insulin half an hour before breakfast and half an hour before the evening meal and (provided I am satisfied that the renal threshold for dextrose of the patient is not below 0 18 per cent) to increase the dose of insulin by two and a half units every third day until the greater number of specimens of urine passed by the patient are free from sugar When this has been attained the patient should go into hospital or a nursing home in order that the final adjustments may be made. As soon as the patient is under close observation I like him to experience a mild hyperglycæmic attack m order that he may become acquainted with the early symptoms and see how quickly he recovers on taking a lump or two of sugar, and also in order to determine if the patient is very sensitive to a low sugar content in his blood Some develop symptoms when the percentage falls to 0 08, whilst others may be free from discomfort at 0 05 Orders are given for the carbohydrate at breakfast to be withheld, often this leads to hypoglycæmia towards midday, m any case a sample of blood is taken at midday If no symptoms have arisen, the dose of insulin is mcreased before breakfast of the following day and once more carbohydrate is withheld at that meal. When the patient has learnt how to recognize hypoglycæmia and how sugar dispells the symptoms, samples of blood are taken at the following times. just before the morning dose of insulin, one hour

satisfactory method of arriving at a diagnosis, in the absence of symptoms, evidence must be obtained that the patient's power of utilizing carbohydrates is declining, the fact that it is below the normal average is not sufficient to permit the diagnosis being made

When the diagnosis has been established there are two methods of treatment available. Which is the more advantageous? The diet may be restricted to a degree sufficient to prevent glycosuma, for a time the patient's symptoms are relieved and he may congratulate himself that he has escaped the inconvenience of having to inject himself with insulin Time passes and glycosuma returns, a further cut has to be made in the diet, and so on until the diet is insufficient to maintain life and insulin must be resorted to, but now there is not the remotest chance of recovery

The other method is to adopt vigorous treatment without delay, this gives the patient a chance of being able in time to cease taking insulin, and in some cases to revert to ordinary food. If this applies to adults, it applies to young children even more certainly. I have seen many children who have been allowed to pass the stage when recovery was possible and been told that eminent physicians have advised against insulin because the patient has been so young. In my experience, young children prove wonderfully good patients and receive their doses of insulin without a murmur.

It has been asserted by some that recovery from diabetes mellitus does not occur, and various papers have been published to prove this, but up to the present I have not seen any in which a successful attempt was made to rest the pancreas for a time. When the diagnosis has been proved beyond doubt the patient is placed upon a diet, the general indications for fixing it have been referred to above. One-third of the

DIABETES MELLITUS

daily carbohydrate is given at breakfast and threeeighths at the evening meal, the remainder is distributed between lunch and tea. The object of giving more carbohydrate in the evening than in the morning is to make it more probable that if hypoglycæmia occurs it will be about midday rather than toward midnight

It is my custom to advise the practitioner to begin with the administration of five units of insulin half an hour before breakfast and half an hour before the evening meal and (provided I am satisfied that the renal threshold for dextrose of the patient is not below 0 18 per cent) to increase the dose of insulin by two and a half units every third day until the greater number of specimens of urine passed by the patient are free from sugar When this has been attained the patient should go into hospital or a nursing home in order that the final adjustments may be made. As soon as the patient is under close observation I like him to experience a mild hyperglycæmic attack m order that he may become acquainted with the early symptoms and see how quickly he recovers on taking a lump or two of sugar, and also in order to determine if the patient is very sensitive to a low sugar content in his blood Some develop symptoms when the percentage falls to 0 08, whilst others may be free from discomfort at 0 05 Orders are given for the carbohydrate at breakfast to be withheld, often this leads to hypoglycæmia towards midday, in any case a sample of blood is taken at midday If no symptoms have arisen, the dose of insulin is increased before breakfast of the following day and once more carbohydrate is withheld at that meal When the patient has learnt how to recognize hypoglycæmia and how sugar dispells the symptoms, samples of blood are taken at the following times just before the morning dose of insulin, one hour

after breakfast, at midday, an hour after lunch, an hour after tea, just before the evening dose of insulin, an hour after dinner, and at midnight

If all these prove to have a concentration of sugar between 0 08 and 0 15 per cent, I am satisfied that the doses of insulin are adapted to the diet that is If the concentration falls too low towards midday or midnight the patient is given 5 grams of carbohydrate in the form of a small biscuit towards 11 o'clock in the morning and at 10 o'clock in the If the concentration of sugar rises too high after meals, but falls below 0 10 per cent four hours after the injection of insulin, I do not straightway increase the dose of msulin, but first see the effect of increasing the interval between the dose of insulin and the meal I have found that in some cases it is wise to increase this to an hour and a-half, but, on the other hand, one of my patients had to reduce it to ten minutes, otherwise he developed hypoglycæmic symptoms while at his meal

Perhaps the greatest difficulty is to keep the sugar from rising too high in the early morning To do this it may be necessary to give an injection of insulin towards midnight, or perhaps it may be more convement to give an injection of insulin suspended in castor oil towards six o'clock in the evening, this will be absorbed slowly and produce an effect for more than twelve hours So long as the end is attained it matters not by which method When the patient has adhered to the treatment for some number of months, hypoglycæmic symptoms may begin to appear towards midday, these symptoms are met with a lump of sugar until they appear with regularity and then a small reduction of the dose of insulin should be made, a reduction of two and a half units, it is essential to make a series of examinations of the blood after meals to be certain that the reduction is justified

DIABETES MELLITUS

and that the sugar in the blood is remaining below 0 15 per cent. If it is found to rise above that concentration there must not be any hesitation in putting the patient back upon the larger dose. In favourable cases a further reduction may be made after an interval and finally a time comes when the patient ceases to take insulin

Any infection must be met by an increase in the dose of insulin. No time must be lost, the dose may have to be multiplied by two, three or four in order to control the hyperglycæmia—when the infection is met in this way, quite frequently the pancreas escapes any further destruction, and after the infection has passed, a comparatively rapid return to the earlier dose of insulin may be made without causing the sugar in the blood to rise above the recognized limit

When the patient has ceased to take insulin, a very careful series of observations on his blood must be made from time to time, and any tendency to relapse treated by an immediate return to insulin been my custom not to increase the diet of patients who have ceased to take insulin, for the first six months and then gradually to increase it, keeping very careful observation about the effect on the sugar in the blood A recovery may not prove a cure, and the patient may still be sensitive to certain bacterial toxins and therefore need the help of insulin if he become infected. As time passes the recovery may become a real cure, and amongst my patients some have had influenza with pyrexia without showing any tendency to relapse A few months ago, my first case of recovery, a man who had intolerable thirst at the onset of the disease. came to see me The concentration of sugar in his blood two hours after a meal was 0 14 per cent On asking him if he kept any kind of diet he replied, "I do not take sugar with apple tart!"

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and perhaps acetone in the urine. The blood-sugar is also high, above 0 2 per cent and usually from 0 3 to 0 5 per cent in untreated cases. The first and second conditions require laboratory tests of the blood-sugar to distinguish them This is essential for the patient because a mild diabetes will progress if untreated, whereas a "negligible glycosuria" requires no treatment. This latter condition is recognized by the discovery of a normal concentration of sugar in the blood, either after an ordinary meal or, better, a glucose test meal, although glucose is present in the urine The normal blood-sugar is below 0 12 per cent in the fasting condition and should not exceed 0 2 per cent after a glucose or ordinary meal The commonest type of negligible glycosuma is pro-duced by a lowering of the renal threshold for sugar, so that glucose leaks through the kidney into the urme at a normal blood-sugar level This is known as renal glycosuria, not an uncommon condition It does not produce symptoms of diabetes, except, occasionally, local irritation from the glycosuria, does not progress into true diabetes and requires no diet restrictions. Another rarer condition occurs in which hyperglycænua and glycosuma, lasting only half to three-quarters of an hour, follow on a glucose tolerance meal, after which the blood-sugar returns rapidly to normal This is called the "lag-storage" curve. Its significance is not understood, but it also seems to be negligible Both these conditions may be suspected by the practitioner because no symptoms of diabetes are present and glycosuria is often discovered by chance. But mild diabetes in its early stages may also give rise to no symptoms and the true condition can be established only by blood-sugar investigations.
The characteristics of a mild diabetic curve after glucose are a rise in blood-sugar above 0 200 per cent and a failure to return to normal, 0 1 per cent,

The Practitioner's Part in the Treatment of Diabetes.

By R D LAWRENCE, M.A, MD, MRCP Brochemist, King's College Hospital

HE average practitioner discovers every year some one or two diabetics, or at least glycosurics, depending on the size of his practice and the frequency with which he tests his patients' urine. He cannot therefore be expected to be familiar with many of the details of modern treatment which, in my opinion, make for the best results. In this treatment the patient, the nurse, the practitioner and the specialist are called to play different parts at different times and the most enduring rôle is the patient's Ultimately the intelligent patient comes to know so much about himself and his disease that the three other partners in the quartette need not feel hurt when their opinions are subjected to close criticism. The diabetic's disease, like the chronic dyspeptic's, is present at every meal and he has, and ought, to think about it This is no reason why they need live abnormal lives or become hypochondriacs, proof of which is given by most diabetics in my experience

What is to be done when sugar (glucose or dextrose) is found in a patient's urine and of what importance is that discovery? From the practical point of view the first step is to discover whether (1) a negligible glycosuria, (2) a mild diabetes, or (3) a severe diabetes is present. The third condition is usually easily recognized from the presence of symptoms of thirst, polyuria, pruritus, etc., and the abundance of sugar

and perhaps acetone in the urine The blood-sugar is also high, above 0 2 per cent and usually from 0 3 to 0 5 per cent in untreated cases. The first and second conditions require laboratory tests of the blood-sugar to distinguish them This is essential for the patient because a mild diabetes will progress if untreated, whereas a "negligible glycosuma" requires no treatment This latter condition is recognized by the discovery of a normal concentration of sugar in the blood, either after an ordinary meal or, better, a glucose test meal, although glucose is present in the urme The normal blood-sugar is below 0 12 per cent in the fasting condition and should not exceed 0 2 per cent after a glucose or ordinary meal The commonest type of negligible glycosuria is produced by a lowering of the renal threshold for sugar, so that glucose leaks through the kidney into the urine at a normal blood-sugar level This is known as renal glycosuma, not an uncommon condition It does not produce symptoms of diabetes, except, occasionally, local irritation from the glycosuria. does not progress into true diabetes and requires no diet restrictions Another rarer condition occurs in which hyperglycæmia and glycosuria, lasting only half to three-quarters of an hour, follow on a glucose tolerance meal, after which the blood-sugar returns rapidly to normal This is called the "lag-storage" curve. Its significance is not understood, but it also seems to be negligible Both these conditions may be suspected by the practitioner because no symptoms of diabetes are present and glycosuria is often discovered by chance But mild diabetes in its early stages may also give rise to no symptoms and the true condition can be established only by blood-sugar investigations The characteristics of a mild diabetic curve after glucose are a rise in blood-sugar above 0 200 per cent and a failure to return to normal, 0 1 per cent,

in two hours

First, it should be recognized that in uncomplicated cases, even the most severe, modern treatment with insulin is invariably successful in restoring health. What is the practitioner's part in this treatment? Many prefer to seek a specialist's advice for their patients, and this is wise, if not essential, when the practitioner has little experience in the modern treatment of diabetes. I think the practitioner's part is decided by whether the case is mild or severe—that is, whether diet alone controls the condition and restores health and strength or whether insulin treatment is necessary. We shall consider these two groups separately

Mild Cases controlled by Diet -This group consists mainly of elderly patients, usually obese There is little tendency for their diabetes to cause wasting or to kill them, at least for many years, and many practitioners seem to think that no treatment is necessary If, however, they are allowed to remain loaded with sugar, they are almost certain to suffer from the complications of diabetes and are liable to neuritis, carbuncles and the much more serious conditions of retinitis with blindness and gangrene of the feet It is, therefore, not safe to neglect them These, and the younger cases who are discovered while their diabetes is still mild, should be treated by the practitioner by moderate restriction of diet The rich carbohydrate foods, all sugar, jams and sweets, should be cut out and bread, potatoes and other foods 11ch in starch should be restricted. If the practitioner manages to keep the urme sugar free in the elderly cases, the results will be satisfactory, though it is still more satisfactory and safe to know that the bloodsugar is also normal The latter is essential in the younger cases if the progress of the disease is to be checked In most of the latter it is wiser to institute—

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at first, at least—an exact weighed diet containing a known amount of carbohydrate, protein and fat and a certain amount of calories and to train the younger diabetics to become experts in diet. Only in this way is there any hope of avoiding insulin and keeping a life-long disease at bay. For it must be recognized that the metabolic defect of diabetes rarely if ever disappears and becomes cured

Severe Cases -- If diet treatment alone does not control the disease (and the diet must be adequate for reasonable energy requirements, as starvation and under-nutration diets can be only temporary measures) insulin injections are the only treatment of any real and lasting benefit This is not sufficiently widely recognized by the medical profession and many doctors are still induced by specious advertisements to use oral preparations, pancreatic or otherwise, which have been proved by rigorous tests to be useless benefits claimed for them are certainly due to the restricted diet adopted at the same time. The only recourse, then, is to insulin treatment which, to obtain lasting benefit, involves the establishment of the correct dose of insulin once, twice or, very rarely, three times a day to metabolize the diet which is deemed best Definite rules can be laid down for the establishment of suitable diets for patients of different weight, age and activity, and a simple one such as the Line Ration Scheme can be easily prescribed and followed by the patient But, unfortunately, the dose of insulin differs for each patient, depending on the severity of the case, and the correct dose has to be carefully established to obtain the best results widely accepted that sufficient doses of insulin should be given to metabolize the diet completely, abolishing glycosuria and acetonuria, and keeping the bloodsugar as near as possible within the normal limits of 0 15 to 0 08 per cent On the other hand, too much

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diabétique), as this makes all the difference to his future comfort and satisfaction. Most cases should also learn to give their insulin injections themselves and to do the simple urine tests for sugar and acetone. And it is important for them to learn something about their disease and the main rules to observe in their treatment. The future of patients who have been put through a thorough initial training is entirely different from those whose treatment has always been rather haphazard.

What is to be the relationship between a patient who has undergone the above training and his prac-That will depend on the latter's knowledge of the disease and his power to help the patient in It is almost inevitable that the intelligent difficulties patient comes to know more about the arrangement of his diet and often about the regulation of his insulin than the practitioner, and the latter must accept this as natural. Many patients study their disease very closely, read all the books they can find on diabetes, test their urine every day and ask their doctors the most searching questions. For example, one of my patients (contrary to my advice) tests every specimen of urne he passes for sugar and acetone and does his own blood-sugar three times a week. He knows far more about his case than I do, although he still comes for occasional advice If ever I venture to suggest a slight change in his treatment he often returns in a month's time with proof that I was wrong! Yet he is by no means hypochondriacal, but a successful business man So it often happens that the skilled diabetic comes to depend mostly on himself or an occasional visit to a specialist for a blood-sugar test, which should certainly be done at least every six months

I shall now mention a few difficulties which frequently arise in the life of these insulin cases in

insulm leads to an overdose by reducing the bloodsugar too low, a condition of hypoglycæmia which is accompanied by unpleasant and even dangerous symptoms

I am often asked by practitioners if they can and should undertake the beginning of insulin treatment, and, on talking the matter over, most agree that it is best to send their patients to a hospital or home for this purpose I think that at least the initial treatment requires special experience and laboratory facilities, and the practitioner should adopt the same attitude in this as in surgical operations practitioners with special opportunities undertake appendicectomy, mastoid operation, etc., with perfect efficiency, although most, as well as the public, consider such work outside their scope In the same way a few who have had unusually wide experience in diabetes manage quite successfully, especially if they have facilities for carrying out blood-sugar examinations The initiation of insulin treatment requires the patient to be put on an accurate—usually weighed—diet Injections are given usually twice a day—before breakfast and supper-and tests of the urine and blood may have to be made once or oftener in the day. Very few practitioners have the time or experience necessary for this So it is usually best to send the patient for ten days to three weeks to a place where this routine can easily be carried out However, if this cannot be arranged, no careful practitioner should hesitate to give a patient the benefit of insulin, as it is possible to obtain good results in most cases without bloodsugar tests A very satisfactory way of treating some patients is to have the initial treatment carried out in their own homes by a nurse specially trained in diabetic work. While in hospital the patient should be taught all about his diet and how it can be made most interesting and satisfying (la cuisine

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learn to make these insulm changes themselves but, in my opinion, they should not get too far out of medical control. All these necessary changes can be best made from the information given by a blood-sugar test which clears up many difficulties. Changes in the diet may also be necessary, and the weight and energy of the patient will show when this is necessary.

Intercurrent Illness - However independent the insulin case may be of his doctor when he is well, he is certain to ask his advice during some intercurrent illness Every illness with infection and fever completely upsets the usual balance of diet and insulin and almost invariably makes the usual dose of insulin msufficient The action of insulin is largely inhibited and considerable readjustments in treatment are necessary to control the diabetic condition, which tends to become worse and lead to severe acidosis (ketosis) and even coma, if adequate treatment is not adopted These circumstances constitute real emergencies, and present the most serious problems and difficulties in the treatment of diabetics. It is not easy to lay down any dogmatic rule, as each case differs with the severity of the infection and the diabetes, but the following suggestions may be helpful. If the patient can eat his usual diet, it should be followed, except that the fat should be largely restricted and the insulin should be adjusted to keep the urine sugar-free or with only traces of sugar do this the practitioner must not be surprised if he has to double or treble the usual daily dose of insulin, and it is better to give it in three or four doses a day than in two large doses For example, a patient who usually takes 30 units a day, may need 60 units during an influenza which it is best to take as 20 units at usual diet he should try to eat his usual amount of carbohydrate in the form of toast, orange juice, milk,

the hope that they will help the practitioner to deal with them

Regulation of Insulin Dosage — The position of an ınsulın case ıs as follows He has been put on an adequate diet and the correct dose of insulin worked out to metabolize this properly so that the urine is sugar and acetone free and the blood-sugar approximately normal. This requires some two to three weeks to do. Improvement usually sets in when the bloodsugars are kept normal and the insulin can and must be reduced to avoid unpleasant symptoms of overdose from hypoglycæmia, slight shakiness, weakness, sweating, palpitation, some three to four hours after the This is an encouraging sign of an dose of insulin improvement which may go on for months and requires progressive diminution of insulin, usually two units a If this is not done the patient becomes dose each time weak and wretched, may be advised to give up insulin as unsuitable, and relapse into his former diabetic condition This decreasing insulin requirement is very marked in patients who become active and take more exercise, as the latter burns up the body-sugar more than usual and readily causes an overdose of insulin Practitioners must often advise their patients to take less insulin, perhaps five units less, if they are going for a long walk or a round of golf within five hours after a dose of insulin

On the other hand, the patient or the practitioner may find that a slight amount of sugar is returning in the urine which had been sugar-free, although the patient feels quite well. This should be met by an increase of insulin by two units each dose and more in a few days if necessary. In this way a tendency to relapse, from whatever cause, will be checked at once and a return to a smaller dose may be possible later. Otherwise carbohydrate tolerance may be permanently lost and more insulin permanently required. Many patients

TREATMENT OF DIABETES

learn to make these insulin changes themselves but, in my opinion, they should not get too far out of medical control. All these necessary changes can be best made from the information given by a blood-sugar test which clears up many difficulties. Changes in the diet may also be necessary, and the weight and energy of the patient will show when this is necessary.

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Horlick's milk or Benger's food, or even sugai drinks, and the insulin should be adjusted as indicated above In this way a dangerous acidosis can be avoided. If, on account of gastric upset the patient cannot retain his usual carbohydrate in any form (a very rare occurrence). the insulin should not be omitted, but half the usual dose should usually be given It is then, if ever, that a blood-sugar test and a specialist's experience needed to decide the best plan to adopt in what has become a dangerous emergency I have seen several tragedies occur, especially in the young, by the complete omission of insulin when the patient could not eat, and such deep coma develop that energetic insulin treatment did not save them The practitioner may be called to such a case at any time, whether he has known the patient before or not, and is faced with the most serious problem Probably the best plan is to give 20 units of insulin if the urine is loaded with sugar and to treat the case as a dangerous emergency and obtain further advice at once

Conclusion — To sum up, the practitioner should ascertain whether a glycosuria is negligible or requires treatment. If the case is mild, he can adequately control the case by restriction of diet, but should make sure, in the younger cases at least, that the blood-sugar is normal as well as the urme. If the case is severe and requires insulin, he should recognize that his experience may be inadequate to obtain the best results, especially in the initial stages of the treatment. But he should insist that his patient receives this treatment, which has never been known to fail in uncomplicated cases since its introduction seven years ago

Some Aspects of Hypoglycæmia in Diabetes.

BY LESLIE COLE, MA, M.D, MRCP Honorary Assistant Physician, Addenbrooke's Hospital, Cambridge

LTHOUGH insulin has now been discovered for seven years, it is not yet used to the extent that it might be in control of diabetes mellitus Expense and the worry and inconvenience of one or two hypodermic injections a day are undoubtedly reasons which, from the patient's point of view, contribute to this, while on the doctor's side fear of severe hypoglycæmic reactions leads in some cases to under dosage It is certain that hypoglycæmia must be treated with respect and avoided when possible, but if due precautions are taken the risk run by treating diabetes with madequate amounts of insulin is much greater than the risk from hypoglycæmia if enough insulin is given to keep the resting blood-sugar within the limits of the normal An attempt is here made to study the incidence of hypoglycæmia in a series of twenty out-patients receiving insulin treatment at Addenbrooke's Hospital The system of treatment is as follows -

All patients with persistent glycosuria are first admitted as in-patients. All septic foci are as far as possible removed and if the diagnosis of diabetes mellitus is confirmed by blood examination an attempt is then made to give a diet adequate for the patient's energy requirements with sufficient insulin to keep the resting blood-sugar in the region of 0 1 per cent

Lawrence's line ration scheme is used in most cases in prescribing a diet, so that the patient can vary

Horlick's milk or Benger's food, or even sugar drinks, and the insulin should be adjusted as indicated above In this way a dangerous acidosis can be avoided If, on account of gastric upset the patient cannot retain his usual carbohydrate in any form (a very rare occurrence), the insulin should not be omitted, but half the usual dose should usually be given It is then, if ever, that a blood-sugar test and a specialist's experience is needed to decide the best plan to adopt in what has become a dangerous emergency I have seen several tragedies occur, especially in the young, by the complete omission of insulin when the patient could not eat, and such deep coma develop that energetic insulin treatment did not save them. The practitioner may be called to such a case at any time, whether he has known the patient before or not, and is faced with the most serious problem. Probably the best plan is to give 20 units of insulin if the urine is loaded with sugar and to treat the case as a dangerous emergency and obtain further advice at once.

Conclusion.—To sum up. the practitioner should ascertain whether a glycosuria is negligible or requires treatment. If the case is mild, he can adequately control the case by restriction of diet, but should make sure, in the younger cases at least, that the blood-sugar is normal as well as the urine. If the case is severe and requires insulin, he should recognize that his experience may be inadequate to obtain the best results, especially in the initial stages of the treatment. But he should insist that his patient receives this treatment, which has never been known to fail in uncomplicated cases since its introduction seven years ago

0 07 and 0 15 per cent

Case IV Female, Age 51 Severe diabetes Standardized on 9 lines and 60 units daily On discharge her resting blood-sugar was 0 11 and she was sugar free She then began to suffer from attacks of faintness coming on in the daytime seven hours after her insulin During these attacks she did not feel mentally clear and felt giddy Insulin was reduced to 55 units daily (25 and 30) and symptoms practically disappeared They still, however, occur occasionally to a slight degree although her urine always contains sugar and her resting blood-sugar keeps between 0 24 and 0 3 per cent

Case V Male, Age 55 Moderately severe diabetes Standardized on 8 lines and 30 units Resting blood-sugar on discharge 0 15 per cent and urine sugar free. One month after discharge he complained of fluttering inside, cramp-like pains in the legs, spots in front of the eyes and a drunken feeling so that he could not walk straight. These symptoms came on in the morning and evening two hours after his insulin and lasted two hours. His resting bloodsugar was found to be 0.06 per cent. His insulin was reduced to 20 units and 2 ounces of bread added to his diet. His symptoms then disappeared. The urine always remains free from sugar

Case VI Female, Age 67 Severe diabetes Found diet very difficult to take because she had no teeth Standardized on 6 lines plus 2 cunces of bread and 20 units a day On this she used to feel very weak and tremulous and perspired a great deal three hours after the insulin The blood-sugar was 0 09 per cent The diet

was then increased to 7 lines and the symptoms abated.

Case VII Female, Age 38 Very severe diabetes Standardized on 10 hnes and 60 units After discharge she complained of faintness, tremors, profuse perspiration, flushes and mistiness in front of her eyes. These symptoms came on 3-4 hours after insulin and were worse after the morning dose. Her resting blood-sugar at monthly intervals remained between 0.09 and 0.14 and she had occasional glycosuma. These hypoglycemic symptoms gradually grew less and passed off without modification of diet or insulin.

Case VIII Female, Age 47 Severe diabetes Standardized on 9 lines and 70 units a day After discharge she complained of attacks of giddiness and a feeling of extreme emptiness coming on 5-8 hours after the morning dose of insulin The blood-sugar varied between 0 06 and 0 09 and she was usually sugar free Reduction of insulin to 60 units and the addition of 2/3rd ounce

of bread to the diet cured symptoms

Case IX Male, Age 21 Very severe diabetes He proved very intractable to treatment and was finally discharged on 6 lines plus 1 ounce of bread and 70 units a day. Some septic teeth were removed in hospital. On discharge his urine was sugar free and his resting blood-sugar 0 19 per cent. Two months after discharge and one month after starting work as a labourer he complained of mid-morning faintness and an additional ounce of bread was added to his diet. His resting blood-sugar was then found to be 0.08 per cent. Three weeks later he had a severe attack four hours after his morning insulin in which without warning he lost conscious-

his diet without varying greatly its carbohydrate or total caloric value Whenever possible the patient is taught to administer his own insulin before he leaves hospital Once this standardization has been completed patients are discharged and are given a solution of 50 per cent glucose to carry about with them and to take if at any time hypoglycæmic symptoms supervene They attend subsequently as out-patients at intervals of from one to two months for examination of urine and for blood-sugar tests During out-patient treatment a resting blood-sugar of 0 1 per cent is aimed at regardless of the absence of sugar in the urine

Under these conditions hypoglycæmic symptoms of varying degrees of severity occurred in 11 out of 20 cases, the brief details of which follow .-

Case I Female, Age 50 Severe diabetes and gangrene of toc which was amputated After operation standardized on eight lines and forty units daily * After discharge she complained of feelings of nervousness and apprehension, hot flushes over the back, quivering sensations in the abdomen and numbness of the hands and feet and occasionally of the body These symptoms first came on two hours after an injection and reached their maximum two hours later They were most marked after the morning injection but also occurred after the evening one. The insulin had finally to be reduced to 10 units daily and one ounce of bread added to the diet before symptoms were controlled. After discharge the urine was always sugar free

Case II Male, Age 48 Severe diabetes Dose of insulin raised gradually to 80 units a day but resting blood-sugar could not be lowered below 0 3 and glycosuria persisted. He had occasional attacks of faintness which came on three hours after insulin and soon passed off. No septic focus could be found and he was suspected of not keeping to his diet.

Case III Male, Age 15½ Severe diabetes. Standardized on 9 lines and 60 units daily. He complained for a few weeks of griddings before to a girl support but this passed off without alternation.

giddiness before tea and supper but this passed off without alteration of diet or insulin. For the last ten months he has been at work on a chicken farm and has had no hypoglycæmic symptoms The urme is usually sugar free and the blood-sugar varies between

^{*} In every case unless otherwise stated the insulin is given in two injections immediately before the morning and evening meals which are made the main meals of the day The bulk of the daily dose of carbohydrate is divided between these meals

HYPOGLYCÆMIA IN DIABETES

0 07 and 0 15 per cent

Case IV Female, Age 51 Severe diabetes Standardized on 9 lines and 60 units daily On discharge her resting blood-sugar was 0 11 and she was sugar free She then began to suffer from attacks of faintness coming on in the daytime seven hours after her insulin During these attacks she did not feel mentally clear and felt giddy Insulin was reduced to 55 units daily (25 and 30) and symptoms practically disappeared They still, however, occur occasionally to a slight degree although her urme always contains sugar and her resting blood-sugar keeps between 0 24 and 0 3 per cent

Case V Male, Age 55 Moderately severe diabetes Standardized on 8 lines and 30 units Resting blood-sugar on discharge 0 15 per cent and urme sugar free One month after discharge he complained of fluttering inside, cramp-like pains in the legs, spots in front of the eves and a drunken feeling so that he could not walk straight These symptoms came on in the morning and evening two hours after his insulin and lasted two hours His resting bloodsugar was found to be 0 06 per cent His insulin was reduced to 20 units and 2 ounces of bread added to his diet. His symptoms then disappeared. The urme always remains free from sugar

Case VI Female, Age 67 Severe diabetes Found diet very difficult to take because she had no teeth Standardized on 6 lines plus 2 ounces of bread and 20 units a day On this she used to feel very weak and tremulous and perspired a great deal three hours after the insulin The blood-sugar was 0 09 per cent The diet was then increased to 7 lines and the symptoms abated.

Case VII Female, Age 38 Very severe diabetes Standardized on 10 lines and 60 units After discharge she complained of faintness. tremors, profuse perspiration, flushes and mistiness in front of her These symptoms came on 3-4 hours after insulin and were worse after the morning dose. Her resting blood-sugar at monthly intervals remained between 0 09 and 0 14 and she had occasional glycosuria These hypoglycæmio symptoms gradually grew less and passed off without modification of diet or insulin

Female, Age 47 Severe diabetes Standardized on 9 lines and 70 units a day. After discharge she complained of attacks of giddiness and a feeling of extreme emptiness coming on 5-S hours after the morning dose of insulin The blood-sugar varied between 0 06 and 0 09 and she was usually sugar free Reduction of insulin to 60 units and the addition of 2/3rd ounce

of bread to the diet cured symptoms

Case IX Male, Age 21 Very severe diabetes He proved very intractable to treatment and was finally discharged on 6 lines plus 1 ounce of bread and 70 units a day Some septic teeth were removed in hospital On discharge his urine was sugar free and his resting blood-sugar 0 19 per cent. Two months after discharge and one month after starting work as a labourer he complained of mid morning faintness and an additional ounce of bread was added to his diet. His resting blood-sugar was then found to be 0 08 per cent Three weeks later he had a severe attack four hours after his morning insulin in which without warning he lost conscious

ness for over an hour Before this he had been working harder than usual, haymaking He was not treated at the time but recovered consciousness and felt well Insulin was then reduced to 60 units and his diet increased to 8 lines. On this he has been at work as an agricultural labourer for the last twelve months and has had no further hypoglycæmic attack.

Case X Male, Age 59, with severe diabetes Standardized on 9 lines and 40 units daily. His resting blood-sugar was 0 14 on discharge and his urine sugar free. On this regime he felt weak and languid so his doctor reduced the dose to 30 units. On this he improved but still felt languid, dizzy and faint five hours after the morning dose of insulin. With reduction of the morning dose only from 15 to 10 units these symptoms disappeared.

Case XI Female, Age 33 Moderately severe diabetes Admitted in coma Standardized on 9 lines and 20 units Resting blood-sugar on discharge 0 09 After discharge she had frequent hypoglycemic attacks coming on about 4 hours after the morning

dose of insulin

Symptoms Shivering, "Head in a whirl," unable to think or settle to work dazed and giddy, occasional numbness of hands. These symptoms only occurred in the morning and particularly if she hurried over her work. One attack came on after she hurried down the town. They were relieved by taking sugar. The addition of an extra 2/3rd ounce of bread and a temporary reduction of insulin to 14 units cured symptoms.

In the remaining nine cases no hypoglycæmic symptoms were noted. Three of these were cases of severe diabetes in patients between 50 and 60, who would not keep to a diet and could not be controlled. Two were children, a brother and sister, both with moderately severe diabetes.

In the first, a girl aged 12½, the consecutive bloodsugar readings at intervals of one or two months on
10 units a day have been 0 25, 0 16, 0 18, 0·14,
0 17, 0 2. The insulin was then increased to 20 units
and the consecutive readings since have been 0 07,
0 09, 0 09, 0 09, 0 1 In the brother, a boy aged
10, who had also severe congenital heart disease with
cyanosis and clubbing of the fingers the consecutive
readings at the same intervals have been 0 22
(on 8 units), 0 11 (on 10 units), 0 1 (on 12 units),
0 04, 0 07, 0 07, 0 1 In both these cases the urine
has never contained more than a faint trace of sugar
and has usually been sugar free and there have been

no hypoglycæmic symptoms

Discussion -To avoid hypoglycemia, some knowledge of the part played by insulin in carbohydrate metabolism is necessary. Such knowledge is at present incomplete, but in a recent summary of the known facts Macleod1 shows that there is no known stage in carbohydrate metabolism up to that in which lactic acid is formed from muscle glycogen that it does not affect In diabetic animals insulin stimulates the formation of glycogen in the liver and inhibits the formation of sugar from fat and protein Under all conditions, both in normal and diabetic animals it causes more carbohydrate to be oxidized, although in the latter this effect is more marked. The net effect of all changes is a lowering of the sugar in the blood notwithstanding the fact that some of its actions such as retarded glycogen formation in the liver would tend to raise it This complicated action must be remembered when using insulin in the treatment of diabetes In actual practice, however, a patient carefully standardized on a fixed diet and a fixed dose of insulin who is living a regular lite may safely continue the same dose practically indefinitely without danger of hypoglycæmia, for there seems to be no evidence that insulin treatment is able to effect any regeneration of islet tissue or cause an increase in the normal output of insulin in any way standardization of diet and insulin has been effected there are two factors which explain many of the mild attacks of hypoglycæmia which do occur The first of these is sepsis

The inhibitory effect of any form of focal sepsis or infection on the secretion of insulin is very well known. It is important to take this into consideration when treatment before standardization has included the eradication of septic foci. In many such cases the removal of sepsis appears to be followed by an increased

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HYPOGLYCÆMIA IN DIABETES

of life from the point of view of muscular work, and if this is greater after the morning dose an increased amount of carbohydrate may be given in the meal following, or the dose of insulin slightly reduced Patients should also be warned that excessive exercise is liable to cause symptoms, but that these can speedily be prevented by a little additional carbohydrate previously or cured by glucose solution

With regard to the blood-sugar level at which hypoglycæmic symptoms developed in these cases little can be said as the blood was not taken during the actual attack. One reading of 0.04 per cent is recorded, at which there were no symptoms, and 0.07 was of frequent occurrence. On the other hand, Case IV, who had quite definite symptoms, always had a resting blood-sugar of 0.2 per cent, and usually 0.3

To treat diabetes mellitus in practice familiarity with the symptoms and causes of hypoglycemia is important not only in order that they may be avoided but because they are in themselves a valuable indication that the upper limit of insulin dosage has been reached. This is particularly the case when blood-sugar estimations cannot be done. Provided that alterations in the dose of insulin and in the diet are made very gradually and never at the same time, and due regard is paid to the activity of the patient and the dosage of insulin after removal of septic foci, no severe reaction is likely to occur while mild reactions can be controlled very easily

I am indebted to Dr C E G Wolf for the blood-sugar estimations done in these cases

Reference

¹ Macleod, J J R Lancet, 1929, n, pp 1 and 55

output of insulin by the body during the succeeding weeks or months and so less insulin will require to be injected. If in such cases the original dose of insulin is continued, signs of hypoglycæmia will develop. The best examples of this are seen in cases of diabetic gangrene which have been cured by amputation. In Case I of this series, the dose of insulin had to be reduced from 40 units a day to 10 units with an additional ounce of bread in the diet before the hypoglycæmia was controlled. In Case IX recovery followed the removal of septic teeth which may have been a factor in the production of severe hypoglycæmia. In hospital this patient's resting blood-sugar could not be brought below 0 19 per cent even on 80 units a day. After discharge, although the same diet and only 70 units a day were continued the blood-sugar fell steadily to 0 08 per cent and, finally, hypoglycæmic symptoms appeared.

The second factor of importance in the production of hypoglycæmia is muscular exercise. Any increased muscular activity leads to increased oxidation of glucose and the blood-sugar is lowered In practice, this commonly shows itself in three ways. In the first place, some patients who have been standardized on a fixed dose of insulin and a fixed diet have no symptoms of hypoglycæmia in hospital but only develop them when they get home and begin to lead more active lives Secondly, hypoglycæmic attacks come on more often and are of greater severity after the morning dose of insulin, a period of the day which is usually a time of greater muscular activity than the evening Thirdly, unusually violent exercise in diabetic taking insulin is liable to cause hypoglycemic symptoms In the cases quoted here symptoms were in nearly every case more marked after the morning dose and often did not occur in the evening at all. It is well therefore to consider in every case the mode

HYPOGLYCÆMIA IN DIABETES

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made to contract by the injection of certain substances, notably peptone and histamine; the constric-tion thus brought about is, however, usually quite transient and is followed by a much more prolonged period during which the bronchi cannot be caused to constrict by further doses This, I am assured by Dr Auld, is exactly what happens in man The immediate effect of the injection may be a severe bronchial constriction, hence a warning is given that the peptone should never be mjected during an attack; subsequently the individual may benefit appreciably, at least temporarily It may be that the intermissions which occur naturally in some cases and those produced therapeutically in others are of a similar nature It should be added that the greatest care has to be taken in administering the peptone, because, as a peptone is made from foreign proteins, there is a distinct possibility that serious results might occur

Nervous Stimulation—The evidence that stimulation

Nervous Stimulation — The evidence that stimulation of the vagus causes constriction of the bronchial muscles was first demonstrated by Brodie and Dixon, and, subsequently, it was shown that adrenalin, the great sympathetic stimulant, caused the bronchi to dilate. The vagus, however, may be excited not only directly, but reflexly. Brodie and Dixon demonstrated that the bronchi were constricted reflexly by stimulation of the interior of the nose, i.e. the endings of the fifth nerve. That asthma can be produced by such stimulation has been adequately proved by nasal specialists, although it must be understood that this stimulation is really only "the trigger" of the asthmatic response, since it does not produce asthma in all persons.

Psychic Stimulation —The parasympathetic, of which the vagus nerve is a part, may also be stimulated by a conditioned stimulus, i.e. psychologically. The secretion of saliva on the presentation of tasty food is

Asthma: An Etiological Survey.

BY R J S McDOWALL, DSc, FRCP Ed

Professor of Physiology, King's College, London, Vice-Chairman, Medical Advisory Committee, Asthma Research Council

ROM the point of view of the physiologist the condition of asthma must be looked upon essentially as a symptom which indicates bronchial constriction with probably some turgescence. In approaching the problem we must consider the various ways by which bronchial constriction may be brought about, the known causes of asthma, and last, but not least, the methods which have been known to alleviate cases of asthma.

Local Irritation —One of the easiest ways to produce constriction of the bronchi is the inhalation of a local irritant, e g sulphur dioxide gas or any other irritant vapour. There is no doubt that direct stimulation is of primary importance in some cases of asthma and may be largely responsible for the asthma of chronic bronchitis (Poulton). Some individuals are extremely sensitive to these irritating gases in amounts which do not affect normal persons. I have in mind a young chemist who cannot stay in a room when sulphur dioxide has been liberated In such instances the bronchial stimulation may be regarded as the result of a purely local irritant and increased sensitivity, such as might be produced on the skin. It is of interest to observe that Bray has found that such asthmatics do not show the lack of hydrochloric acid in the stomach so common m other types of asthma

Chemical Stimulation -The bronchi can also be

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might be expected from vagal stimulation, but this may quite likely be absent as it is counteracted by the asphyxia which is produced. It has, however, been noted that the blood-pressure is commonly low in asthmatics. Some remarks on the circulation in connection with asthma will be made later.

The vagus is also related to the blood-sugar level It has been shown by McLeod and by Clark that stimulation of the vagus causes a fall of blood-sugar, presumably by causing the pancreas to secrete insulin It has been found by H C Cameron that asthmatics commonly have a low blood-sugar Such a secretion of insulin may more directly bring about the eosmophilia of asthma, since it has been shown by Lawrence that in diabetes the administration of insulin causes eosinophilia In further support of the view that the vagus is intimately concerned in asthma is the knowledge that in some cases asthmatic attacks are much more common when vagus activity is normally at its maximum, that is when the individual is at rest at night or at the week-end, and during digestion

Now it is quite evident that irritation of the nose, for example, is common in many persons, and yet only in some does it cause asthma. This does not mean that those who claim that the nose or foreign proteins are responsible are wrong, even although the patients are cured by treatments other than nasal or those related to abnormal proteins. It can, indeed, be stated dogmatically that the average man who makes observations is seldom wrong, and the history of medicine shows that when two disagree they are both probably right. There are many asthma camps, but two great ones are those whose leaders consider that the nose is at fault and those who think that some form of allergy or sensitiveness is present. During the last few months I have succeeded in showing that they are both prob-

familiar to everyone, and again it has been shown that gastric secretion and movements, which are normally augmented by the vagus, may be affected by mental states, for example, the dislike of certain foods due to their association with unpleasant associations in the past The erection of the penis is another example of pyschic stimulation of the parasympathetic (nervi erigentes) Dixon gives the very interesting example of a dog in which vomiting was produced by a hypodermic injection Vomiting, there is every reason to believe, is associated with vagus activity, and eventually the dog vomited whenever the syringe was brought to its notice, although actually no injection was given These facts seem important because they are experimental evidence of a psychological stimulation of the vagus Once an attack of asthma becomes associated with a certain article of diet or circumstance of life the asthma is liable to occur even in the absence of the original cause of the attack. Where the pollen of a rose causes asthma, it has been found that the mere sight of an artificial rose may cause an attack Such cases clear up under psychological treatment, provided the original cause of the complaint has already been removed It will, of course, be understood that many quack remedies, especially of a violent character, cause benefit in this way

In considering the question of vagus activity, however, it should be remembered that this nerve has many other functions besides its action on the bronchi, and inquiry may well be made about the evidence of the other effects of vagal disturbance. It augments intestinal movements and causes glandular secretion, and it is quite definitely known that asthma is associated with excessive bronchial secretion and less frequently with intestinal disturbance, such as colitis I do not know whether or not slowing of the pulserate has been observed before an attack of asthma, as

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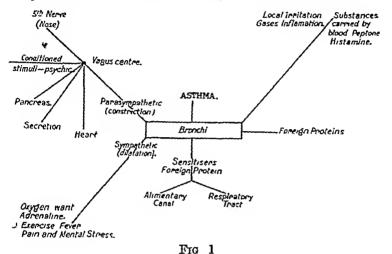
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ably right, for the introduction of some form of protein into some animals (but not all) causes a greatly increased sensitivity of the vagus If peptone, made from foreign protein, is injected into the blood-stream the slowing of the heart and the constriction of the bronchi caused by pilocarpine—the drug by which vagus stimulation can most conveniently be brought about-18 enormously enhanced, and a dose which normally would have little effect may almost kill the animal Since this work was done, it has been found by Stolard, Sherwood, and Woodbury that the excitability of the vagus (chronaxie) is increased by the previous injection of foreign sera Further, an analogous state has been described by Freund and Gottlieb, who found that peptone or foreign serum causes an enormous mcrease in the salivary response to pilocarpine What varieties of foreign proteins have this effect I am at present trying to determine. It seems, therefore, that hypersensitive vagus is really what Hurst has described as a hypersensitiveness of a bronchial centre

It is interesting to notice that Eppinger and Hess have for years insisted that asthmatics are unduly sensitive to pilocarpine, but in the absence of definite experimental evidence their work has been largely ignored. In confirmation of the importance of abnormal protein is the fact that the injection of such protein is one of the few known methods of producing experimentally an eosinophilia, to which Adam has drawn attention in "Asthma". It is known also that in some animals the injection of foreign protein causes an increase of amino-acids in the blood, which Oriel has shown to be the case in many asthmatics. This point will be considered later. Dr. Sarkar, in my laboratory, is at present investigating the exact mechanism of the eosinophilia. It may be due in part to a fall of the blood-sugar, as already suggested, or it may be a direct result of the foreign proteins. Unfortunately, however,

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the cosmophilia cannot be produced experimentally in all animals. That foreign proteins increase the sensitiveness of the vagus, which is now published in this country for the first time, appears to be somewhat a key of some importance in the asthma problem. We may therefore construct a diagram as follows—



In addition to the effects of the abnormal protein in enhancing vagus activity, the abnormal proteins themselves bring about a temporary bronchial constriction. This activity becomes enhanced in typical anaphylaxis. It should, however, be emphasized that it is not at all necessary to assume that all asthma is truly anaphylactic in nature and brought about by a particular variety of protein, and that the attack is necessarily precipitated by a special protein, since many other stimuli will suffice

These remarks have been rather confined to the bronchi, but it should be stated that this increased sensibility or instability produced by abnormal proteins is not confined to the bronchi and heart, but is general to all the autonomic nervous system, including the peripheral vessels. The general vasomotor instability

m asthma has been pointed out by Alex Francis Others have shown that the cutaneous reactions, for example, which are given by abnormal protein, are due, apparently, to the hyperexcitability of a local nervous mechanism (probably an axon reflex, since the reactions are not obtained if the skin is cocamized).

We must therefore definitely consider the possi-bility that abnormal proteins enter the body by various channels, some may enter by the bronchial tract itself, as suggested by Storm Van Leeuven seems quite possible also that there may be special substances which cause local irritation of the mucous membrane, just as we get a sensation of the skin to a vast number of substances. The protein may be of bacterial origin (Willcox), and some may enter by the alimentary canal (Freeman). In this connection it is of interest to note that my colleague, Dr Pickering, has shown that madequately digested protein, probably as peptone, may enter the blood in such quantities as actually to affect the coagulation of the blood has also found that many asthmatics show a delayed coagulability between the attacks It is well known that rashes and signs of the anaphylactic state may be produced in certain individuals when they eat certain articles of diet In cases in which the protein enters the blood without being fully digested it is evident that the dietetic treatment must become more important It is possible that this may account for the fact that some of these treatments have an influence on protein absorption and metabolism. Some forms of treatment simply cleanse the alimentary canal, and it is claimed by some using them, e.g. Harrington, that not only the asthma in many instances, but even the skin sensitization, is caused to disappear. Bray, who has been investigating asthma in children, has also noted that the skin sensitiveness may vary very much from time to time in the same patient, and may be

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reduced by treatment directed towards assisting protein digestion

It may be that factors which either produce or relieve an attack may affect protein absorption or metabolism. For example, some patients find that a purgative which hastens intestinal movement causes an attack (Hurst) It may do so by facilitating the absorption of undigested protein

Others find that the administration of pepsin and hydrochloric acid will generally benefit the patient This may do so by increasing protein digestion (Hurst, Bray)—It is possible that many therapeutic measures merely cause a secretion of gastric juice

The work of Oriel appears to be of some importance in this connection. He has found that there is an excess of amino-acids in the blood of asthmatics and that a proteose is excreted. It may be that these substances represent fractions of foreign proteins which have gained access to the blood through a faulty intestinal absorption. The proteose may readily be an incompletely digested protein of the diet. Possibly, on the other hand, the additional amino-acids are liberated into the blood-stream as a reaction against abnormal protein, for, after all, the chief abnormality of any protein lies in the fact that it is composed of different amino-acids or proportions of amino-acids from human proteins.

The administration of sal volatile and glucose, which has been found to be of benefit in some cases, especially in children, by Cameron and by Oriel, is apparently the direct opposite of the view of dietetians, that excessive carbohydrates in the diet are liable to aggravate if not produce asthma. It is possible that carbohydrate as glucose interferes less with protein digestion than carbohydrate as starch, as it is the diet, or it is possible that the starch is not properly digested to glucose This point does not appear to have been investigated.

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arrange the facts in a physiologically orderly manner. It would also be possible to show how the successful results obtained by various forms of treatments can be explained Nasal treatment, psychotherapy, dietetics, and adrenalin have been referred to, but the vast number of procedures which can definitely cause sympathetic stimulation or reduction of vagus activity might have been included, such as ephedrine, atropine, exercise, mental excitement (merely being in hospital is commonly sufficient), cold baths, sensory stimulation, anything which produces fever (e.g. vaccines), starvation, oxygen want, solourn at a high altitude, or carbon monoxide and carbon dioxide Morrow has observed an instance of a man who in attempting to commit suicide by inhalation of coal gas so relieved his asthma that he used it subsequently as a treatment The gentle asphyxia caused by merely putting the head under the bedclothes has also been found useful There is also the injection of products of tissue breakdown, such as peptone and histamine, or the product of actual tissue breakdown by cauterization of any part or by X-rays It may be that vaccine therapy, which has been found useful, depends in part on the injection of similar substances, rather than on the immunity produced The most important contribution to this subject is probably that of Dale and Burn, who showed that histamine, which is a product of the breakdown of practically all tissues, leads to a secretion of adrenalin, i.e. causes sympathetic stimulation

The effect of exercise probably requires some explanation, as many patients complain that exercise makes them worse. I have seen an asthmatic attack completely aborted by making the patient (much against his will) take the violent exercise of running up the stairs of King's College. Cases in which exercise make the patients worse, in those with an irritable autonomic nervous system, are due in all probability to the "after-

In connection with the treatment by glucose it is interesting to remark that some cases of asthma claim to have been cured by honey, thus indicating that it is possible that the investigation of any remedy which has cured asthma may be of value in the final solution of the problem. It should, however, be kept in mind that the sal volatile and glucose may make the body more capable of dealing with foreign protein, for we have reason to believe from the work of Werner that the formation of urea from amino-acids may thus be assisted

It seems quite possible that the congenital aspect of asthma, which is so often stressed, is really a congenital incapability, possibly digestive or possibly metabolic, of dealing adequately with foreign protein. Alcaptonuria and cystinuria are examples of inborn abnormality of metabolism of amino-acids, of which proteins are composed. It is but a simple step to consider that some similar metabolic abnormality may apply to protein as a whole

With the co-operation of Miss Shore and Dr Robson, I have been attempting to show that certain amino-acids in the protein molecule may be more important than others in relation to our present problem. Up to the present the only suggestive evidence obtained is that tryptophane, one of the amino-acids which is essential to life, brings about in some animals general increased vagus activity. For reasons, however, which we cannot determine, we have been unable so far to obtain consistent results with different animals. As each amino-acid takes weeks to make this work proceeds very slowly

It will be seen from the above how the many divergent views on asthma all really fit into a simple picture Many of the facts given here are not new, and can be found in books, such as those by Alexander, by Adam, and by Coke, but an attempt has been made to

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arrange the facts in a physiologically orderly manner It would also be possible to show how the successful results obtained by various forms of treatments can be explained Nasal treatment, psychotherapy, dietetics, and adrenalin have been referred to, but the vast number of procedures which can definitely cause sympathetic stimulation or reduction of vagus activity might have been included, such as ephedrine, atropine, exercise, mental excitement (merely being in hospital is commonly sufficient), cold baths, sensory stimulation, anything which produces fever (e.g. vaccines), starva-tion, oxygen want, sojourn at a high altitude, or carbon monoxide and carbon dioxide. Morrow has observed an instance of a man who in attempting to commit suicide by inhalation of coal gas so relieved his asthma that he used it subsequently as a treatment The gentle asphyxia caused by merely putting the head under the bedclothes has also been found useful There is also the injection of products of tissue breakdown, such as peptone and histamine, or the product of actual tissue breakdown by cauterization of any part or by X-rays It may be that vaccine therapy, which has been found useful, depends in part on the injection of similar substances, rather than on the immunity produced The most important contribution to this subject is probably that of Dale and Burn, who showed that histamine, which is a product of the breakdown of practically all tissues, leads to a secretion of adrenalm, ie causes sympathetic stimulation

The effect of exercise probably requires some explanation, as many patients complain that exercise makes them worse. I have seen an asthmatic attack completely aborted by making the patient (much against his will) take the violent exercise of running up the stairs of King's College. Cases in which exercise make the patients worse, in those with an irritable autonomic nervous system, are due in all probability to the "after-

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effects" rather than to the exercise itself

It is not proposed to evaluate the various methods of treatment A combination of alimentary, nasal, psychological, and desensitizing treatments, together with sympathetic stimulation by one or several of the methods just enumerated, is most hable to be of permanent value From what has been said it is clear that each case is best treated according to its nature so far as can be determined Where, for example, the patient has been found to be sensitive to a specific protein desensitizing treatment is essential. Many treatments do not really get at the cause of the condition, but they may in a large number of instances "cure" the patient, especially where a psychical element has become engrafted on the original condition, but render him free from attack for a sufficiently long time by making him believe he has got rid of what caused the asthma habit. I use the term "habit" advisedly, as there is little doubt that each asthmatic attack disposes, largely for nervous and psychological reasons, to another

The greatest need in relation to asthma is to find out more exactly the nature and mode of production of sensitization; when this is discovered the cause of a vast number of allied diseases will also be revealed

Suppurating Deep Iliac Glands.

BY HAMILTON BAILEY, FRCS Surgeon, Dudley Road Hospital, Birmingham

Acute and acute attention of deep iliac glands forms a clinical entity which has not received the attention it deserves, it is far from rare, and may give rise to serious symptoms. Acute appendicitis, acute purulent arthritis of the hip joint, and acute osteomyelitis of the femur are the three conditions which are particularly likely to resemble it. To fail to recognize the condition or to confound it with those diseases which it mimics may prove a serious matter. It is improbable that the clinician will arrive at a correct diagnosis of suppurating deep iliac glands unless his attention has been directed to its peculiar train of symptoms and signs.

The symptoms are often sudden in their onset and the patient complains of pain in the side, most often located near the groin, but sometimes in the iliac fossa. Vomiting is not unusual. In none of the cases which I have seen has the diagnosis been at once apparent, one of the three conditions referred to above has invariably entered the clinical picture. In the majority of instances it is possible to exclude these conditions, and it is often possible to make a positive diagnosis.

We will proceed with the examination of the case, indicating the physical signs which are usually present, and draw attention to those signs of particular value in differential diagnosis

Psoas spasm is a leading feature, particularly in the early stages of the disease. The patient lies with his

leg drawn up (Fig. 1). At first sight the possibility of acute hip-joint disease or (on the right side) acute appendicitis, rightly crosses our mind

On asking the patient to point to the place where the pain is located the pointing finger is usually directed

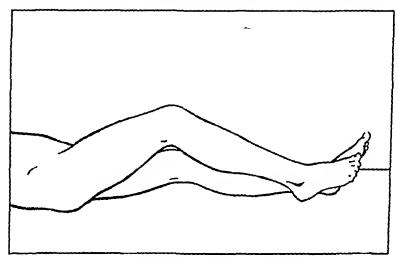


Fig. 1 -Psoas spasm The hip joint is flexed

to the neighbourhood of Poupart's ligament In the very young this sign may not be applicable.

It is convenient to commence examining the femur; well away from the site of the pain, the lower end receives initial attention. The condyles are pressed (Fig. 2), then the shaft, care being taken not to job the limb. Firm, steady pressure causes no pain, as is evident by watching the facial expression. Attention is then directed to the upper end of the femur, and realizing that we are nearing the pathological zone, each manœuvre is commenced delicately. The great trochanter is sounded by increasing pressure, and then the antero-external surface of the shaft to the lateral side of the rectus femoris (Fig. 3). In making deep pressure in the last situation, which is so well-clothed with muscle, it is advisable to steady the flexed knee so as to prevent jolting of the hip

SUPPURATING DEEP ILIAC GLANDS

or stretching the contracted psoas

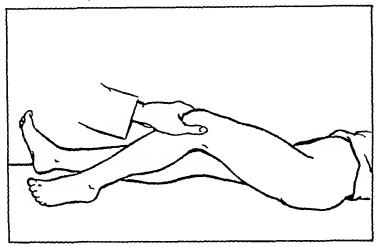


Fig 2 -- Exerting deep pressure over the condyles of the femur

Deep pressure on the femur being painless, the next item is to examine the hip joint. Grasping the ankle, the already flexed hip and knee are still further flexed just a little more by cautiously raising the limb. The free hand is laid upon the knee to steady the limb

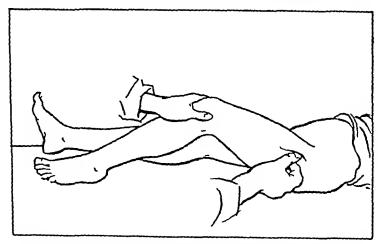


Fig. 3 —Exerting deep pressure over the upper third of the shaft of the femur. The left hand is employed in steadying the limb during the manœuvre

while the most gentle rotation is attempted (Fig. 4) The excursion of a few degrees externally and int nally is quite sufficient to impart to the examiner

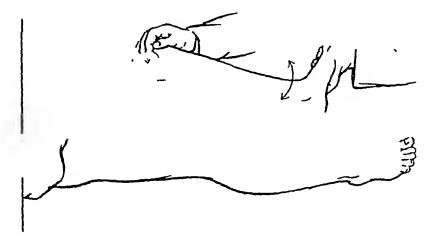
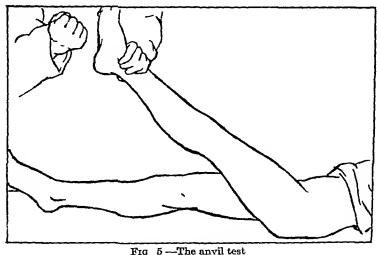


Fig 4 -Rotation of the hip joint being tested

sensation that movement of the head of the femur within the acetabulam is free, and by watching the patient's face it is evident that they are painless Growing bolder as the result of this information, the flexed knee joint is extended and the anvil test applied The anvil test is of particular value in (Fig 5)



SUPPURATING DEEP ILIAC GLANDS

excluding hip-joint disease in this instance acute osteomyelitis of the femur and acute purulent arthritis of the hip joint have been excluded

Inspection of the abdomen Observe the abdomen in the early stages of inflammation of the deep iliac When an abscess has glands is not instructive

developed, a fullness may sometimes be seen just above the upper half of

Poupart's ligament

Palpate the abdomen. Rigidity and tenderness will be localized to the iliac fossa, but is more pronounced beneath and to the inner side of the anteriorsuperior iliac spine Contanuing palpation a fullness, or more often an actual- stuation of a lump lump, can be felt in this situation On the right side a problem (Fig 6)will arise—is this an appendix abscess?



Palpate the superficial inguinal gland on each side (Fig 7) An enlargement, particularly a tender

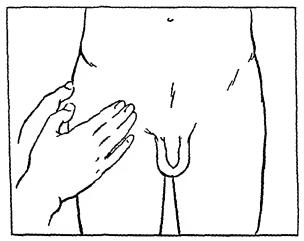


Fig. 7 —Palpating the superficial inguinal glands

enlargement, of the superficial gland obviously supports the hypothesis that the deep glands are involved like-

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wise Unfortunately, for some reason which is not clear, the superficial glands are often not involved

The next duty is to scrutinize the limb for an infected focus. Remember to look at the toes and heel, and the back of the limb, as well as the more accessible parts. The finding of a possible focus of infection in the shape of a scratch or sore is very significant. Such a focus is found in about three-quarters of the cases.

There remains a small group of cases in which the differential diagnosis between suppurating deep iliac glands and appendix abscess is still difficult. Some help may be derived from an inquiry as to the site where the pain began. In an initial attack of appendicitis the pain rarely begins in the right iliac fossa. If an examination of the flank for tenderness (retrocæcal appendicitis) and a rectal examination (pelvic appendicitis) are negative, one can picture the problem becoming insoluble. Such an unfortunate combination of circumstances hardly ever enters the diagnostic arena.

Treatment — The patient should be placed Fowler's position If appendix abscess has been excluded the patient may have a fluid diet, otherwise water only is allowed until the diagnosis is settled Fomentations are applied if the pain continues pulse and temperature are charted every two hours. Usually, in the course of a few days, flexion of the hip disappears, and in a proportion of cases resolution of the inflamed glands takes place More often an abscess forms which requires opening Under the anæsthetic the lump is palpated and an incision is made in its most prominent part, erring perhaps a little to the lateral side to avoid opening the peritoneum. and a little nearer the anterior-superior iliac spine to avoid the deep epigastric artery Usually the most convenient point will be found quite near the anteriorsuperior iliac spine (Fig 8) If by error (usually

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in diagnosis) the peritoneum is opened and the abscess is found to be extraperitoneal and unconnected with the appendix the peritoneum should closed and the abscess dramed by a lateral stab

Illustrative Cases — In all except one (Case 6), the pre-operative Fig 8—Incision for diagnosis of suppurative deep iliac draining an abscess glands was made in a manner similar to that described above The clinical

connected with suppurating deep iliac glands

notes are therefore only briefly reported. The pulse and temperature is so variable in these cases as not to be instructive All of the patients recovered

- Case 1 A fish-frier, aged 39, suddenly felt pain in the right grom which later spread over the whole abdomen He vomited twice and went to bed Thirty-six hours later he was sent to hospital and diagnosed as acute appendicitis On examination the right thigh was slightly flexed but could be extended voluntarily The inguinal glands on the right side were found enlarged and tender A tender lump was found above Poupart's ligament On looking at the leg an infected blister was seen on the heel Three days later an extraperitoneal abscess was drained
- Case 2 A boy, aged 6, had symptoms almost identical with case 1 The inguinal glands were not enlarged. On examining the limb a purulent blister was found on the heel Twenty-four hours later the thac abscess was opened and a large quantity of pus evacuated
- Case 3 A youth, aged 17, whilst coming out of a picture palace experienced acute pain in the right groin. He went home to bed Two days later he got up and went to work After half an hour he had to return home Soon afterwards he vomited five times the sixth day he was admitted to hospital His right hip was flexed and he looked very ill He had passed no urine for twelve hours, and the bladder was distended. A catheter withdrew normal urine (reflex retention) Tenderness was marked just above Poupart's ligament The superficial inguinal glands were enlarged and tender No primary lesion could be discovered on the limb Three weeks later the symptoms had entirely abated A complete urmary examination was negative Appendicectomy was performed and the organ was found to be normal

Case 4 A man, aged 28, suddenly developed acute abdominal pain and vomited Twenty-four hours later he was admitted as a case of acute appendicitis. He stated that the pain began in the

wise. Unfortunately, for some reason which is not clear, the superficial glands are often not involved.

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A Simple Abortive Treatment of Influenza.

By EDMOND NESNERA, M.D Budapest

HAVE employed the treatment described below in more than 1,500 cases with success during the grave epidemic in 1918-19 as well as at the time of the influenza epidemic in succeeding years. Success depends on two factors—the medical practitioner and the public—Medical practitioners should not pass over the description of this treatment merely because these powders which I use have previously been employed in the treatment of influenza, for it is the method of using them which is the important factor. Successful treatment depends on its early application, at latest within the first 24 hours, and this both the public and the medical profession should understand and act upon

When a practitioner is first called to a household or a boarding-school, he should not be content with recommending simple hygienic measures, but should emphasize the necessity for immediate treatment of the next person who is attacked. Only by so doing will he perform his duty towards society at large. In this way a barrier is built up round the sources of influenza. I affirm that, with the simple method described below, the quick and successful suppression of influenza epidemics has become simply a matter of sanitary organization.

(1) The Drug—The drug used is a powder composed of quinne hydrochloride, phenacetine, and aspirin, of each 5 grains for adults, i.e., between the age of 18 and 60. In the case of serious epidemics, powders of 17 grains may be administered. For children about the age of 5 to 6 one quarter of the dose given to adults, from 8 to 10 one third, from 12 to 14 half of the dose given to adults, at the age of 15 to 16,

right iliac fossa. On examination the right hip was slightly flexed and tenderness was maximal just above Poupart's ligament. The superficial inguinal glands were found enlarged on that side, and an infected abrasion was found over the shin. The case was treated expectantly, and one week later an extraperitoneal abscess was opened in the manner described.

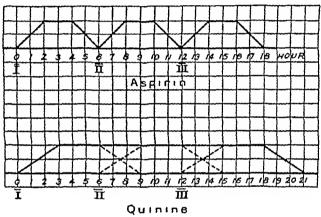
Case 5 A boy, aged 7, was admitted as ? osteomyelitis of the head of the femur, ? left-sided appendicitis. He was gravely ill. The left thigh was flexed thirty degrees and the spine was arched from the bed. There was an indurated painful swelling just above Poupart's ligament. The superficial inguinal glands were not enlarged. Over the shin there was a healing sore. Eight days later pus was evacuated by an incision below and internal to the anterior-superior iliac spine.

Case 6 A boy, aged 7, had pain in the abdomen for a week On examination the right hip was flexed. Extreme tenderness and some rigidity were present in the right iliac fossa. As there was no sign of a testis on the right side a diagnosis of ? torsion of an abdominal testis was made. Under the anæsthetic a lump was felt in the right iliac fossa. The peritoneum was opened through a grid-iron incision. The appendix was normal and accessible, so it was removed. The lump was found to be extraperitoneal. After closing the peritoneum the fascia transversalis was stripped laterally off the internal oblique until the abscess wall was reached. The abscess was then drained through a stab incision and the original wound closed. A thorough examination of the limb did not reveal a primary focus.

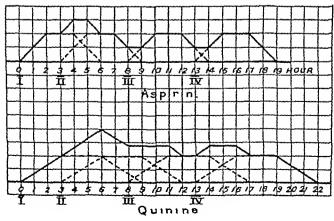
Case 7 A boy, aged 13, was admitted as acute purulent arthritis of the left hip. One week before admission pain began suddenly in the left hip. He looked very ill. The hip was flexed. Hip-joint disease was eliminated by the method described. A tender swelling was found above Poupart's ligament. The inguinal glands were small, shotty, and not tender. A minute infected scratch was found over the left knee. Three days later, as his temperature still remained high, a rather deep extraperitoneal abscess was opened in the manner indicated.

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upon my questioning them upon the way in which they administered their drugs, they invariably told me that they did it in the usual manner, ie morning, noon and evening, or else morning, noon, afternoon and evening. This is wrong, because during the longer intervals between the taking of the powders, the micro-organisms of disease retain their virulence, the effect is not sufficient for the disinfection of the body. In the following diagram I demonstrate the effect produced by medicine administered every six hours.



The effect of the method which I have described is, on the other hand, as follows —



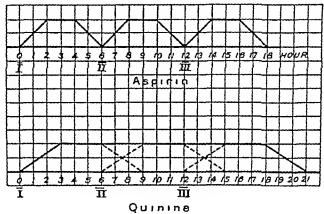
two-thirds, at the age of 17, three-quarters of the dose for adults, and the same for people of about 65 and over.

(2) The Method of Administration.—The first powder should be taken directly after the onset of symptoms. Then, according to the seriousness of the case, a second powder should be taken two and a-half to three hours later. After an interval of four and a-half to five hours the third powder is given. After another interval of four and a-half to five hours, a fourth powder is given. The strict observance of the times at which the first four powders are given plays a determinative part in the treatment. The hours when the powders have to be taken must be strictly observed, even if the patient should be asleep or if the hour for the administration of a dose should fall in the night. If the treatment is begun in time, the fever generally stops after the first four powders If, however, treatment be left off, there is a risk that after one feverless day a relapse will occur, at any rate in some of the cases Therefore, after the fourth powder has been taken, wait for four and a-half to five hours, then begin administering halfpowders every three to four hours, about four to six half-powders a day, according to the extent of the infection. On the third day, even if the patient has no fever, give at least four half-powders. Should the patient continue to be subfebrile, even then four or five half-powders should be given for a few days longer. To stop the cough as soon as possible is very important from the standpoint of the extension of the disease I warn all my patients against getting up too soon

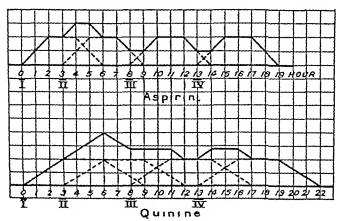
When I recommended this treatment to my colleagues, most of them answered that the effect of the mixture of the various powders was well known, and that they, too, used similar drugs But

TREATMENT OF INFLUENZA

upon my questioning them upon the way in which they administered their drugs, they invariably told me that they did it in the usual manner, ie morning, noon and evening, or else morning, noon, afternoon and evening. This is wrong, because during the longer intervals between the taking of the powders, the micro-organisms of disease retain their virulence, the effect is not sufficient for the disinfection of the body. In the following diagram I demonstrate the effect produced by medicine administered every six hours



The effect of the method which I have described is, on the other hand, as follows —



In consequence of the effects of the first two powders acting directly on each other, the curve set out here has a higher and longer wave. Thus the body is exposed for a longer time and to a stronger effect of the medicine. If this effect is produced at the beginning of the illness, it has as a result the suppression of the infection and the disinfection of the body.

I suggest, therefore, that at the next influenza epidemic this method of treatment should be tried on a large scale. For this purpose the best test would seem to be in local epidemics at medical institutions, boarding-schools or in the army. There we are able to get at the illness at its inception, and also the problem of control groups of patients is solved in the simplest way.

The Physical Treatment of Neurasthenia.

By G LAUGHTON SCOTT, B.A., M.R.CS, L.R.CP Late Senior Physician, London Neurological Clinic

"OR practical purposes," it has been well said, "neurasthenia is abnormal fatiguability, and abnormal fatiguability is neurasthenia." Purposes even more practical might be served if it were realized that impaired and abnormal function of the entire organism is the cause of this fatiguability, and that neurasthenia is not more rightly a neurological study than a problem of physiology.

Yet it is usual to find this complex condition described as though its depredations were almost confined to the nervous system, for only if this standpoint be adopted, to the exclusion of any other, can it be maintained that physical signs are as scarce as subjective symptoms are plentiful He would indeed be a glutton for signs who was not satisfied with the range of phenomena which indicate that the whole economy of the body is out of gear The first appearance of the typical neurasthenia suggests a sick man and a toxic man Complexion is often sallow, bodily carriage slack and listless, the tone of the muscles poor, as is shown by the limp handshake, the rounded shoulders, the lax abdomen, while more or less atony of the alimentary tract is revealed by the X-rays The tongue is rarely clean, the breath often foul, the gums unhealthy, and indications of defective digestion frequent Blood-pressure in the absence of associated arterial changes, is subnormal, and the evidence of vasomotor fatigue in the quick blanching of face and hps is unmistakable Respiration is shallow, and

In consequence of the effects of the first two powders acting directly on each other, the curve set out here has a higher and longer wave. Thus the body is exposed for a longer time and to a stronger effect of the medicine. If this effect is produced at the beginning of the illness, it has as a result the suppression of the infection and the disinfection of the body.

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any one factor acting alone

Upon what broader and more comprehensive basis can this physical reconstruction be brought about? The healthy individual, who aspires to the athlete's perfection of bodily function, relies but little upon artificial aids, depending upon natural means and simple rules of life to improve his muscular effective-Shall it be otherwise when the neurasthenic, not envious of the athlete's splendid powers, desires a lower, but still sufficient, level of function? For him the problem is complicated at every stage by the over-fatiguability and over-sensitiveness which are part of his condition But internal cleanliness and the proper exercise of the muscular system as a whole are the avenues of all progress towards more effective function when organic disease is absent, and it is surely essential to set the patient's feet in these paths. though at first he may need many a therapeutic crutch to help him At any rate, I have found that the best and most permanent results are obtained by a wise combination of these general methods which are grouped under the name physiotherapy. This is not to imply the neglect of any special procedure which may be necessary in the particular case, nor to preach reliance on important machines or therapeutic novelties, but I maintain that a physiotherapeutic regime leads most naturally to the restored use of every function, and towards the recognition of plain rules of health which every neurasthenic must adopt if he is to become and to remain well.

It is the aim of this article to indicate the general lines which I have found most useful in this physical rehabilitation, and, for purposes of description, it may be well to make a division into the four periods of observation, detoxication, re-education and aftercare

(1) Observation —The full examination of a severe

the vital capacity of the lungs reduced Temperature is low, metabolism is low, exercise-tolerance is low. Indeed, whatever system be examined the objective signs of impaired and irregular function present a significant picture

It must, however, be admitted that the mainly physical conception of neurasthenia has led to disappointing results in the field of therapy. This is true of numerous methods and systems which have from time to time been advanced by physicians who have not made the mistake of neglecting the psychological needs which must be satisfied in all these cases. in such hands there is not one medical or surgical system or procedure which is recognized as generally curative The strict Weir Mitchell regime, with its special insistence on rest and over-nutrition, is more or less definitely obsolete, though it has found an attenuated survival in the dreary ritual of the modern rest-cure Study of the bacteriological side of the problem, with removal of septic foci and vaccine therapy, has won but moderate success, while of the so-called "intestinal disinfectants" the best that can be said is that not quite everybody has found them use-Electrical, balneological, glandular therapies, have dealt with isolated points of the problem, but, though they are admitted to have some value as adjuvants, they have not realized the high hopes that were entertained when they were first employed The weakness of all such methods, when they are not fundamentally unsound, is surely that they are overspecialized. Great things have been expected of them, but their therapeutic attack is upon too narrow a front

For if it is right to consider neurasthenia to be a physical malfunction of the whole organism, as varied in its manifestations as it is diverse in causation, it would be unreasonable to hope that the manifold activities of the whole man could be made good by

TREATMENT OF NEURASTHENIA

be withheld

(3) Physical Re-education —Within a few days the lightest possible remedial exercises are undertaken. The admirable breathing and abdominal movements, devised by Macmahon, are very suitable at this early stage. These may be done in bed, occasion the minimum of fatigue, and rapidly improve abdominal tone. It is an important point that all the early exercises are done in the supine position, and do not involve locomotion which is so liable to cause fatigue. Application of the static position. Much, too, may be learned from Hornibrook's treatise on the culture of the abdomen, though his movements are more complicated.

After the fast, prominence is given to the question of dietary. Care must be taken to avoid implanting seeds of faddism, but the value of a simple and largely uncooked diet is not to be denied. Every neurasthenic is to some degree toxic, and I regard it of first importance to avoid milky slops and proprietary extracts, and to secure food that is wholesome, fresh, and so far as possible raw. The work of Leonard Williams may be profitably studied in this connection, but some concession must be made to the palate, and the avoidance of fresh meat is rarely to be recommended.

At this stage, various physiotherapeutic applications have a subsidiary usefulness. Ultra-violet light does something to increase the sense of well-being, while abdominal massage and diathermy will help digestion. In regard to massage, it may be noted that whereas general massage has always to be applied with carefor too much of it may easily increase fatigue—local massage of the abdomen does not involve the same risk, and may be employed more boldly. But within the month it is generally possible to prescribe walks of increasing lengths, and gradually to discard artificial

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and long-standing case must be spread over several days, and will include, as a matter of routine, X-ray photographs of the teeth and alimentary tract, and bacteriological cultures of the intestinal flora. It is important to record accurate measurements of muscular power, with special attention to the abdominal parietes, of the vital capacity of the lungs, of cardiac exercise tolerance and of blood-pressure. Periodic remeasurements will prove useful for estimating progress throughout the treatment.

(2) Detoxication -- When any foci of local infection have been dealt with-and these are not so frequent as might be guessed-attention is directed towards clearing the system of that accumulation of metabolic products which is characteristic of all sluggishness of function This milder type of toxemia, probably always present in the neurasthenic, commoner than lesions in which definite bacteriological abnormality can be found, and to secure freedom from this is of primary importance. However debilitated the patient, he can almost always undergo with safety one or two days of complete abstention from food, receiving only plentiful fluids, water, weak tea, Vichy water, etc This fast, protracted to extreme lengths in the "nature cure" homes, is of signal value if conducted with care and for a short time only Colonic irrigation is performed daily, and after the fast a diet of fresh fruit alone is adopted for one or two days have used the preliminary fast in nearly a hundred neurasthenic cases, without anxiety arising so long as the subject is kept warm in bed.

During the fast, any slight discomfort that may occur will be lessened by the use of hypnotics, while increasing doses of belladonna are valuable when there is depression. With restlessness, immersion in a cool bath between 93° and 95° F. produces a pleasantly sedative effect. Some alcohol should not

The Treatment of Hyperpiesia by Intestinal Douches.

By A A BISSET, M D

Harrogate

YPERPIESIA, as described by Sir Clifford Allbutt, is a condition of high blood-pressure without any arterial or renal changes, "a malady in which at or towards middle life bloodpressure rises excessively, a malady having a course of its own and deserving the name of a disease" Professor "The phenomenon of per-J A MacWilliam ² states sistent elevation of the arterial pressure may be regarded from different standpoints and given quite different interpretations It may be looked on as a result of irritative and deranging influences (circulatory toxins or other causes) frequently leading to the development of symptoms of ill-health, increasing the work of the heart and tending to cardiac failure, stressing the vascular walls, promoting their degeneration and predisposing to cerebral hæmorrhage, kidney changes, etc From another point of view the high pressure may be looked on as essentially a compensatory process, while attended in the long run by certain unfavourable effects on the heart and blood-The raised pressure is regarded as compensatory in the sense of its maintaining the circulation or driving more blood through some vital organ that requires it-for instance, the brain, kidney, heart

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aids in favour of more natural and more energetic physical culture. So soon as the patient leaves his room it will be well to provide a time-table of his various activities. Thus, a short walk before breakfast; a hot bath followed by the cold douche, breakfast; rest till 11 a m. and a walk before lunch, are directions of the sort that will help to prevent the ennur of unassigned leisure.

(4) After-care.—This is the period of country holiday in which the patient is only concerned to persevere in his plain dietary, with abundance of fruits and salads; to improve his stamina by lengthening walks and by such games as he affects; and to shake off any taint of invalidism that still remains. Four to six weeks, with a case of ordinary severity, should be sufficient to secure such progress that it may be left to the holiday, of similar length, to complete and consolidate recovery. In estimating the length of treatment necessary, it is well to remember that quite moderate improvement under active treatment will often mean a satisfactory final issue when the medical atmosphere is exchanged for country surroundings

A wrong impression will have been conveyed if it appears from this general description that the physical regime outlined can be applied without much care and labour. No curriculum will win any constant success that is not elastic and modified to suit ever-varying needs and particular emergencies. At every stage the physician must be at hand to persuade, encourage, stimulate; to make the treatment purposive and to explain its purpose. This is no matter of general supervision, but a task which involves continuous personal interest in every detail

TREATMENT OF HYPERPIESIA

"pressor" nature may possibly be manufactured as derivatives of bacterial activity in the intestines and especially in the colon, and Langdon Brown has stated that intestinal stasis will cause a pressor effect. That such pressor agents may be very active in raising the blood-pressure has been demonstrated by Kamm Westphal ⁸ found hypercholesteræmia in 71 per cent of his cases, and states that protein cleavage products may also cause an increase of blood-pressure

Based upon this theory of the colon as a possible source of pressor substances a series of cases of essential hypertension have been treated with intestinal douches All these cases were carefully examined to exclude any evidence of renal changes or renal insufficiency. Major 9 shows that there is, in hypertensives, a decreased excretion of methyl-guanidin and creatinin. This renal function was not tested in this series number of cases in the series was 25 males and 37 females. All were treated with intestinal douches for varying periods, usually about two to four weeks, each case being treated on its own ments. In douching, the strong sulphur water of Harrogate was used in quantities from 20 to 40 oz at a temperature of 100-104° F., and with a pressure of some 18 to 24 inches Some of the cases, owing to idiosyncrasies, had smaller quantities and even lower pressure Blood-pressure readings, taken before and immediately after the douche, showed decreases varying from 40 mm Hg the pressure rising again to nearly the original figure in the course of twelve hours, but showing over a period of days a definite decrease

The rapid fall during the douche is difficult to explain Lissimore 10 has shown that the sulphur water of Harrogate exercises a marked bactericidal effect on B. coli and several of the streptococci and staphylococci of the intestine, but the disinfectant

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muscle, etc.—either when the flow has been subnormal or when a higher pressure and more rapid flow would be useful in view of functional or structural defects in the tissue"

It has been emphasized by Lord Dawson³ that essential hypertension of arteries and arterioles if it persists long enough will eventually lead to renal and arterial changes, due possibly to the mechanical effects of the high blood-pressure, and therefore any form of treatment which can effectively reduce this high pressure should prevent such bad results as chronic nephritis, heart failure, and apoplexy from developing. It is admitted that the condition of hypertension greatly decreases the expectation of life, and Fahr 4 has stated that in the United States more than 70,000 deaths occur from this condition every year in persons over fifty years of age, and that 70 per cent of the deaths registered as "heart failure" in America had hypertension as the primary cause Janeway 5 showed that about 25 per cent of his series died after a period of ten or more years of renal insufficiency, and 46.7 per cent of cardiac conditions Fisher 6 in his statistics covering 2,857 cases of hypertension shows that continual high blood-pressure definitely shortens the expectation of life, and that the shortening of life is proportional to the degree of hypertension Fisher also found that the end-results in 66.5 per cent were of a renal nature and 17 per cent were due to cardio-vascular changes

The cause of increase in blood-pressure remains one of the baffling problems of medicine. Many theories have been advanced to account for the development of this condition, but the real cause has not yet been demonstrated. Long-continued auto-intoxication from some septic focus is believed by many investigators to be an important factor. Chemical substances of a

TREATMENT OF HYPERPIESIA

function of the kidneys

TABLE I

Cases	Average age	Average B P before treatment.	Ditto after treatment.
Males (25)	65 7	Systolic Diastolic	Systolic Diastolic 137 4 80 56
Females (37)	60 4	162 7 90 3 mms Hg	130 19 79 8 mms Hg

A certain number of cases of high blood-pressure associated with arterial or renal changes were also treated by intestinal douching, but did not show any improvement on this form of treatment alone

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⁴ Fahr, G Am Journ Med Sci, 1928, clxxv, 453. ⁵ Janeway, T C Arch Int Med, 1913, xii, 755

- ⁶ Fisher, J W Proc Ass Infe Ins Med Directors, 1917, 203 N York
 ⁷ Kamm Jour Am Chem Soc, Feb, 1928
 Region 1925, J

8 Westphel Zeit Khin Med, Berlin, 1925, June

Major, R. H. Am Jour Med Sc., 1928, clxxvi, 637.
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¹¹ Lewis, T "The Blood-Vessels of the Human Skin and their Responses," p 149, 1927

¹² Barger and Dale Journ Phys, 1911, xh, 499

effect would probably not be apparent in such a short time. The temperature of the sulphur water—about 102°-104° F.—may cause a depressor effect by dilating the blood-vessels of the colon, and, reflexly, those of the small intestine as well. Lewis 11 states that the liberation of vasodilator (H) substance results indirectly from the effect of increased temperature, whilst Barger and Dale 12 have shown that the intestinal mucosa contains a definite amount of histamine, and it may be that the temperature of the douche liberates this depressor substance into the circulation in quantities sufficient to influence the blood-pressure If this supposition is correct then it may be argued that a possible cause of essential hypertension may be due to a lack of balance of the pressor and depressor sub-stances in the human body. The decrease that is observed over a course of two or three weeks is probably due to the removal and elimination of pressor toxins and harmful bacterna from the colon, and to the therapeutic effects of the sulphur water on the mucous membrane of the colon

From the table it will be seen that the average fall in systohic blood-pressure was 37.6 mms. Hg in the males and 32.5 mms. Hg in the females. The corresponding figures for the diastohic pressure were 13.7 mms. Hg and 10.5 mms. Hg. One patient, a lady of 74, after three weeks' treatment, showed a drop of blood-pressure from 210 mms. Hg systohic and 110 mms. Hg diastohic to 140 mms and 80 mms respectively. Following the decrease in blood-pressure the cases were again examined by the urea concentration test (McLean), and were found to have increased power in urea concentration, but this increase in power was not in any way proportional to the fall in blood-pressure. From this it may be assumed that fall in blood-pressure does not impair renal function, and that hypertension is not compensatory as regards the

Practical Notes.

The Treatment of Diverticulitis

F Gordon Bell observes that diverticulitis has now passed the stage of being considered a rarity and is sufficiently common to demand attention because of the difficult and dangerous complications that may attend it, and also because of the difficulties in diagnosis As regards treatment, medical treatment has a definite place and in selected cases may stave off indefinitely the necessity for surgery It naturally yields its best results in the milder, more chronic cases of the self-limiting type and as a supplement to Management may be summed up as consisting in regulation of the bowel by suitable diet including plenty of fruit and vegetables, regular dosage with paraffin and laxatives if required, but avoiding purgation as likely to precipitate acute trouble as with malignant obstruction Daily colon lavage at low pressure is Surgical treatment must be graded to suit the particular patient and in the great majority the septic condition of the affected colon forbids immediate radical surgery Colostomy, preferably transverse, is required in acute cases with abscess formation or obstruction and in vesico-colic fistula Subsequent treatment calls for good judgment in deciding if and when the colostomy can be closed and if resection of the diverticular segment can be performed The patency of the bowel and the length of available colon below are the important factors in each case Lockhart-Mummery states that bladder fistula usually closes after colostomy, and in any case plastic repair is best deferred till the colostomy and drainage of pelvic abscesses have cleared up gross sepsis. Stage resection after Mikulicz may occasionally be feasible in selected limited types Isolation of the affected segment by an omental wrap, as advised by Lockhart-Mummery and Gordon Watson, is sometimes available and seems specially suitable when the diverticular segment lies in the pelvis and perforation of the bladder is threatened freemg of the mass with fixation in the left iliac fossa and pelvic dramage, if necessary, seems a sound procedure and with subsequent medical treatment colostomy may be avoided Immediate laparotomy, with closure of the perforation or colostomy, is required for perforating diverticulities and peritonitis—(Journal of the College of Surgeons of Australia, November, 1929, p 226)

The Treatment of Ringworm of the Scalp

L B Kingery states that the treatment of ringworm of the scalp with thymol and cinnamon oil offers advantages over the other more complicated methods of treatment. He supports his thesis by the results of 12 cases, 8 of which have been clinically and microscopically cured for periods of from four months to one year, 3 have enjoyed complete restoration of hair and no recurrence of symptoms for equivalent periods, and only 1 case has required other remedies. The hair of the scalp is clipped short, a washable

Editorial Notes.

WE regret to record the death of our The late distinguished contributor, Sir William Sir William Milligan, M.D., LL.D., who wrote the Milligan. opening article on "Radium in the Treatment of Malignant Disease of the Upper Air and Food Passages" in our last number Only the day before he was taken suddenly ill, Sir William had returned to us the corrected proofs of his article, which was marked with all his accustomed vigour and distinction. It was the last of his many fruitful contributions to the literature of laryngology and otology, and the last letters which he wrote were

in connection with this article

As a contrast to the last number of The Practitioner, which was a Special Number dealing with various aspects of diseases of the ear, nose and throat, and their treatment, the present number includes a great diversity of subjects It may appear to our readers to be smaller than usual, but actually there are 96 pages of text in this issue instead of 68 pages, which was the usual number of pages in an ordinary number last year The appearance of smaller size is due to the new paper which is being employed; this paper was first used in the Special Number on the Ear, Nose and Throat, in order that the 58 illustrations in that number could be printed in the text. This proved such a successful experiment that it has been resolved to continue to print The Practitioner on the new paper and to encourage our contributors to illustrate their articles freely We hope that authors will now realize that their articles can be illustrated by photographs and wash drawings, as well as by line drawings, and that they will give us every opportunity of doing so

PRACTICAL NOTES

logical lesions found at autopsy vary from simple congestion of the bladder to marked pyelonephritis. The somewhat similar condition in older children is, in the author's opinion, always associated with congenital or acquired malformations of the urmary tract, or some infection in the neighbourhood of either kidney or ureter Such children may present a variety of symptoms, such as abdominal pain, fever, chills, emaciation and, occasionally, various disorders of micturition Pyuria is the constant finding Congenital or acquired malformations of the urmary tract lead to urmary stasis, and when stasis occurs infection is likely to ensue. The pyuria which results runs a protracted course, associated with fever, emaciation and progressive degeneration of the urmary organs It is the author's belief that every child with a protracted pyuria which fails to respond to the usual methods of treatment should be subjected to cystoscopic and roentgenological examinations within a reasonable time The extreme limit of this reasonable time is a period of six weeks The author asserts that pathological lesions of the urmary tract in infants and young children are capable of fullest urological examination, and that such conditions should be investigated early, before marked degeneration of the urmary organs has occurred.—(Canadian Medical Association Journal, December, 1929, p 685)

The Treatment of Premature Separation of the Placenta

R A Bartholomew points out that premature separation of the normally implanted placenta is often accompanied by a degree of shock which is out of all proportion to the amount of hemorrhage Shock is more frequent in the cases accompanied by toxemia and is aggravated or precipitated by any trauma sustained during delivery. The high feetal mortality in the condition demands that the first regard must be paid to the mother. Inductive of labour, watchful expectancy, stimulative and supportive treatment offer the best prognosis, shock, if present, should be treated first and labour then induced, if pains have not begun. Cæsarean section or difficult forceps delivery are associated with an increased maternal mortality, especially in the severe cases—(American Journal of Obstetrics and Gynecology, December, 1929, p. 818.)

The Treatment of Pernicious Anæmia

V Schilling supports the conclusion of the great value of liver treatment in permicious anima. In a series of 80 cases, 50 recovered from the disease, most of the others showed marked improvement, and in only 5 was the treatment unsuccessful, though in 4 of these cases the treatment had been employed for but a short time. In only one case did the condition become worse in spite of liver treatment, but this patient suffered from menorrhagia. It was found that liver extracts often did not bring about the desired improvement, and fresh liver was found to be more effective—

(Deutsche Medizinische Wochenschrift, October 11, 1929, p. 1701)

cap is worn constantly and frequently changed, a bi-weekly soapsud shampoo is given, and three times daily there is applied a solution of gutta percha B P C containing one-half of I per cent thymol and I per cent oil of cinnamon, in cases in which this resulted in irritation, the frequency of the applications was decreased— (Archives of Dermatology and Syphilology, December, 1929, p 767)

The Treatment of Mentère's Disease

J Rebattu defines Memère's disease as a violent vertigo, accompanied by a fall without loss of consciousness, preceded by an intense tinnitus and followed by immediate deafness. It occurs, however, in milder and diverse varieties. As regards treatment, the patient should be put to bed, rest should be absolute, and the ear passages should be blocked with cotton-wool The diet should be light and preferably cold On the day after the attack a drastic purgative should be given, and leeches should be applied to the mastoid areas Quinine may be given in small doses (0 02 to 0 10 gram), or the following prescription may be given —

Quinine hydrobromide - - Ext valerian - - -I centigram († grain)

These pills should be given twice daily for a month, extract of belladonna (1 centigram) may be added to the formula —(Journal des Praticiens, December 21, 1929, p 841)

The Prognosis in Eye Injuries

J A Donovan suggests that there never will be a time when any man or group of men can foretell the possible results in severe eye injuries, but the probabilities are that useful eyes can be obtained in a great majority of cases The author is not unmindful of that terrible calamity, sympathetic blindness, but he feels that with improved therapeutic methods and careful observation its possibilities may be more frequently eliminated at not too great a cost When infection is imminent, mutilation is beyond repair, the patient's lost time is of vital importance, or other conditions are present in which the ophthalmic surgeon must be the sole judge, immediate enucleation is imperative When ultra-conservatism fails, that most satisfactory operation, enucleation, is always at one's command —(Journal of the American Medical Association, December 21, 1929, p 1934)

Pyuria in Childhood

R R Struthers states that simple pyehtis of infancy may be considered to be a different disease, clinically, from the frequent pyuria of older children. It may be considered an acute, selflimited disease, responding comparatively readily to medical treatment, of short duration, characterized by a tendency to recurrence, and associated with the onset and course of other infections, either respiratory or gastro intestinal. The patho-

Reviews of Books.

The Principles of Bacteriology and Immunity By W W C Topley, M.A., M.D., M.Sc., FRCP, Professor of Bacteriology and Immunology, University of London, and G S Wilson, MD, M.RCP, DPH, Reader in Bacteriology and Immunology in the University of London Vol I, pp xvi and 587, and index xvi, Vol II, pp viii, and 588-1300, and index xx, Figs 142 Tables 168 London. Edward Arnold & Co 1929 50s

Professor W W C Topley, previously Director of the Pathological Departments at St Thomas' and Charing Cross Hospitals and Professor of Bacteriology in the University of Manchester before he became Director of the Department of Bacteriology and Immunology at the London School of Hygiene and Tropical Medicine, and Dr G S Wilson, his colleague at the two last schools, have out of their ample experience in teaching post-graduate students taking a full-time course for a year in bacteriology, and leading to a university diploma, succeeded in the difficult task of providing a textbook which will meet the requirements of such students anxious to make a serious study of bacteriology and its application to the problems of infection and resistance Each of the two volumes contains two parts, volume one deals with general and with special bacteriology or matter with which every bacteriologist should be familiar, parts in and iv in volume two, on infection and resistance and on the application of bacteriology to medicine and hygiene respectively, are concerned with the problems of bacteriology in application to infective disease It is desirable that bacteriology should be thus treated as a pure science and not wholly from its application in human practice, it should also be considered in connection with epidemiology and animal diseases, for the authors rightly point out that "in no branch of medical science is the sterilizing effect of the anthropocentric attitude more obvious than in the study of bacterial infection" Professor Topley's pioneer work on the experimental production of epidemics of infections in laboratory animals is well known, and readers will naturally turn with interest to the chapter on herd infection and herd immunity The opinions expressed on doubtful problems are broad-minded rather than dogmatic, as is well shown in the discussion of the bacteriology of acute rheumatism. The manner in which information and suggestive ideas are given in this encyclopædic work and the lists of selected references appended to the chapters will make these volumes an invaluable source of reference to all medical men wanting such help, and of inspiration to the advanced student and prospective research worker

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THE PRACTITIONER

Control of Dosage of Ultra-violet Rays

E Bridge suggests that the treatment of morbid conditions by ultra-violet radiation will be more successful when control is more definite. Proper control applies to the environment of the patient, the source of energy and the susceptibility of the individual to ultra-violet rays. The fractional method of treatment with doses indicated by the erythema tolerance gauge aids in determining the dosage of individual patients. The aim should be the production of an erythema that is just evident at the end of twenty-four hours, and not pigmentation—(Medical Journal and Record, New York, December 4, 1929, p. 639.)

The Value of the Complement Fination Test in Gonorrhea

T E Osmond and J O Oliver review the results of tests on more than 5,000 sera from unselected patients, some suffering from gonorrhœa or syphilis or both, and others with no venereal disease or history of such The very low percentage (0 6 per cent) of false positive results appears to show that the complement fixation test is remarkably specific. In all but the very early cases a high percentage of positive results is obtained, ranging from 50 per cent and upwards, and reaching almost 100 per cent in the cases of gonorrhea with complications Generally speaking, a positive result is not to be expected during the first ten days of the disease unless complications have occurred, when an early positive result is obtained this is probably due to extension of the infection to the posterior urethra in the male or to the cervix uteri in the female The authors are at variance with other workers with regard to the disappearance of the positive reaction with cure, since in their experience, following clinical cure, the change from positive to negative occupies in many cases a relatively long period A positive result is almost diagnostic in any stage of the disease. A negative result is of similar significance to a negative Wassermann reacton, it may occur in almost any stage of the disease and is of limited value except in the differential diagnosis of complications, such as arthritis and epididymitis In tests of cure a negative reaction is of particular value if the case has previously given a positive reaction, it has already been stated that a positive result may be retained for a varying time following clinical cure Vaccines (more particularly stock ones) appear to have but little effect on the result of the reaction when used in the doses commonly employed, but it would appear that an autogenous vaccine is much more hable to influence the result -(British Journal of Venereal Diseases, October, 1929, p 281)

Preparations, Inventions, Etc.

A SYRINGE AND NEEDLE FOR THE INJECTION OF HÆMORRHOIDS

(London Messrs Allen & Hanburys, 48, Wigmore Street, W 1)

Mr W B Gabriel, F.R.C.S., writes as follows—Having adopted the treatment of internal hæmorrhoids by the high submucous injection of 5 per cent phenol in vegetable oil, as described by Albright and Blanchard, I have been compelled to discard the syringe which the late H Graeme Anderson devised and which bears his name. This syringe proved extremely valuable for many stage of the disease so developed that the patient is bedridden, and is nearing extinction, and has produced crippling from medicinal and helio-therapeutic measures are recommended, and treatment of deformities is illustrated by plates of two splints

Acute Infectious Diseases A Handbook for Practitioners and Students By J D ROLLESTON, M.A., M.D. (Oxon), M.R.C.P. (Lond), F.S.A. Second Edition Pp 419 London William Pp. 10. Dec. 10.

DR ROLLESTON'S book on the acute infectious diseases may be regarded as the standard work in the English language on this important subject. The first edition appeared in 1925, this, the second edition, contains additional matter of importance, including a clear account of recent methods of prophylaxis and immunization in scarlet fever, diphthenia and measles, and of the serum treatment of scarlet fever which merits the close attention of every practitioner. The chapter on vaccination contains the latest work on this difficult subject, including a brief account of the nervous sequelæ which have been recently brought prominently before public notice. A valuable feature is the excellent bibliography appended to each a section. For the general practitioner this book should prove of constantly brought in contact.

(Nottingham Messrs Boots Pure Drug Co , Ltd , Station Street)

We have received samples of a new pastille which Messrs Boots have recently put on the market at a retail price of one shilling per tin. Each pastille contains the equivalent of 20 minims of glycerinum thymol co. B.P.C fortified by the addition of a new antiseptic, amyl-meta-cesol, which was discovered in the

THE PRACTITIONER

A Textbook of the Practice of Medicine By Various Authors Edited by Frederick W Price, MD Third Edition Demy 8vo, pp xxxviii and 1,871, illustrations 115 Oxford Humphrey Milford, Oxford University Press 1929 36s

This popular textbook, which includes sections on diseases of the skin and on psychological medicine, first appeared in 1923, and after four impressions passed into a second edition in 1926 Though the present thoroughly revised edition is only some fifty pages longer than the last edition, it contains much new material, recent points, such as abortus infections and vaccinal encephalitis, being A number of new articles have been added, such as sickle-celled anæmia, infraction of the heart, thrombo-angutis obliterans, diseases of the diaphragm, lipodystrophia progressiva, and Schilder's disease (encephalitis periaxialis) The difficulty of satisfactory classification of disease is a necessary consequence of changing and advancing knowledge, and some alterations have therefore been made in the arrangement of diseases, such as yellow fever and those of the kidney, the etiology of which has recently been further elucidated The editor must be cordially congratulated on the result of his labours

The Intern's Handbook A Guide to Rational Drug Therapy, Clinical Proceedings and Diets By Members of the Faculty of the College of Medicine, Syracuse University, under the direction of M S Dooley, AB, MD Foolscap 8vo, pp xix and 254 London J B Lippincott Co 1929 12s 6d

This, as the cover graphically depicts, is a book for the pocket of the white-coated house surgeon or physician, and supplies information so arranged and indicated by the table of contents and index as to be available with the least possible delay Of its two parts the first gives an alphabetical list of standard drugs and the treatment of poisoning, the doses are given both in the metric system, which the reader is directed to use, and in the ordinary minims, grains, and so forth There is the stern warning that "the use of other than official names and abbreviations of drugs or their English equivalents is evidence of an intern's irresponsibility" This high American ideal might be disadvantageous for an Englishman in a hurry to find the dose of what is commonly called luminal might easily pass by the entry in this list of "Phenobarbitalum-Phenobarb" without recognition and enlightenment The second and longer part provides tabloid information on a large number of procedures, such as case-taking, treatment, serums and vaccines, diets, incubation periods of fevers, and obstetrical emergencies

The Treatment of Rheumatoid Arthritis By A. H. Douthwaite, M.D., FRCP, Assistant Physician, Guy's Hospital Crown 8vo, pp x and 80, 2 plates London H K Lewis & Co 6s

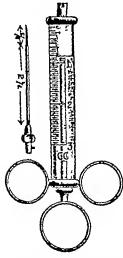
This small book, which provides in clear language a great deal of information, is divided into two parts. In the first part,

Preparations, Inventions, Etc.

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fine a bore A larger Record syringe with a needle having a standard Record mount proved unsatisfactory in use owing to the difficulty experienced in fixing the needle firmly to the syringe when using this oily solution I have, therefore, had made for me a modification of the original Graeme Anderson outfit, as follows syringe holds 3 c cm and is graduated in tenths of a c cm The valuable bayonet fitting for the needle is retained, which permits immovable attachment of the needle to the syringe The base of the needle is bored out as wide as possible and a No 20 standard wire gauge stainless steel needle is now fitted. The total length of the needle has been increased to 33 inches The syringe and two needles are fitted into a small case as before find that the oily solution, even when cold, flows very readily through this needle,

with quite light pressure, and the high injection of the solution in adequate doses is rendered easy

COMPOUND GLYCERINE OF THYMOL PASTILLES

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The Prevention of the Diseases Peculiar to Civilization By Sir Arbuthnot Lane, Bart, CB, MS, Consulting Surgeon to Guy's Hospital, and to the Hospital for Sick Children, Great Ormond Street Crown 8vo, pp xiv and 99, figs 44 London Faber and Faber 1929 3s 6d

This small volume is based upon the articles contributed by the President of the New Health Society to the Daily Mail, and argues that faulty habits of civilization, particularly constipation, produce structural changes in the body which inevitably result in a chain of diseases of varying gravity. There is, in fact, a restatement in popular language of Sir W. Arbuthnot Lane's well-known views. In the preface he rightly insists on the great importance of prevention of disease, and in the last chapter the objects of the New Health Society are set out.

Sex and its Mysteries By George Ryley Scott Crown 8vo, pp iv and 198 London John Bale, Sons and Danielsson, Ltd 1929 10s 6d

This book is by a layman, the author of "The Truth about Birth Control," and a Fellow of the London College of Physiology, an institution the address of which is not revealed in the telephone directory. It is intended only "for serious study, and the sale is restricted to members of the Medical and Legal Professions, olergymen, teachers, scientists, and Health and Social Workers." It is proceedings, reserved from pornography and is clearly and sensibly written diets, incubation periods of fevers, and obstetrical emergencies.

The Treatment of Rheumatoid Arthritis By A H DOUTHWAITE, M.D., FRCP, Assistant Physician, Guy's Hospital Crown 8vo, pp x and 80, 2 plates London H K. Lewis & Co 6s

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research laboratories of Messrs Boots, this antiseptic has a Rideal-Walker co efficient of 250 and is present to the equivalent of $2\frac{1}{2}$ grains of pure phenol in each pastille. Experiments carried out have shown that there is complete absence of bacterial growth in samples of actual mouth washings when subjected to the action of one of these fortified pastilles, whereas the colony count in similar mouth washings is only approximately halved by an equivalent quantity of the ordinary compound glycerine of thymol solution. The pastilles have a refreshing flavour and in our opinion should prove to be both useful and popular.

PROGYNON

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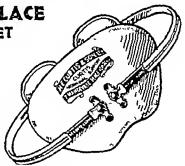
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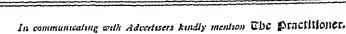
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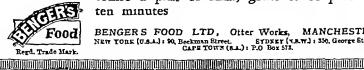
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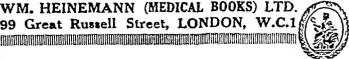
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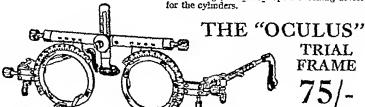
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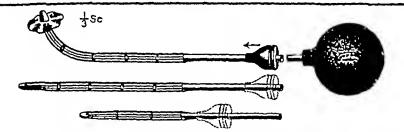
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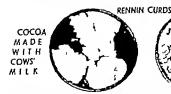
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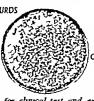
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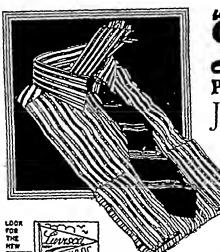
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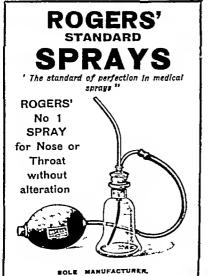
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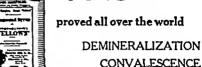
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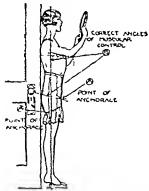
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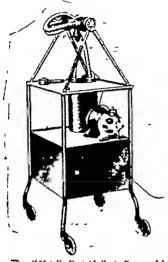
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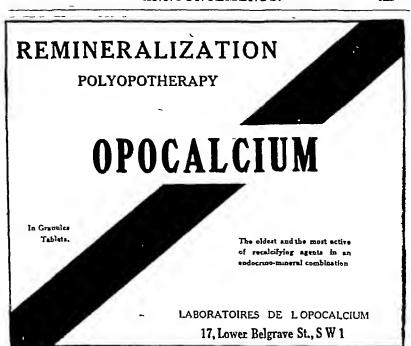
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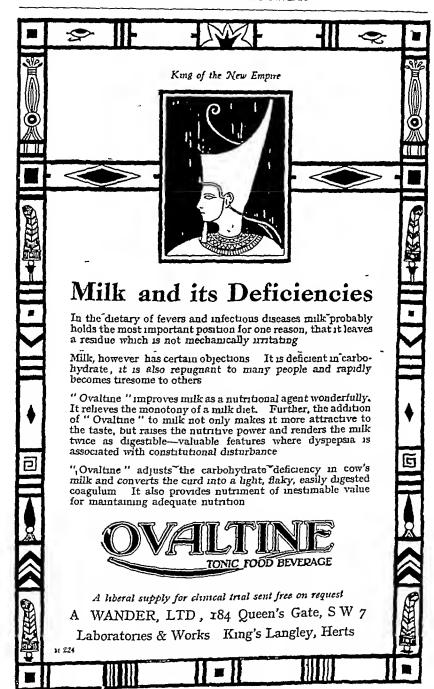
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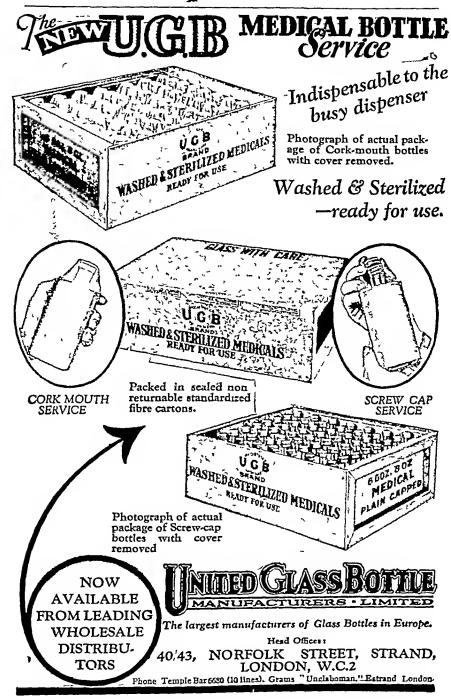
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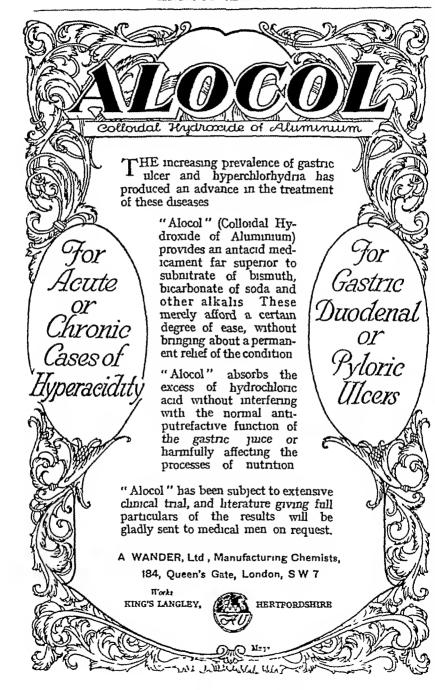
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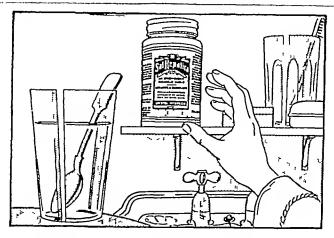
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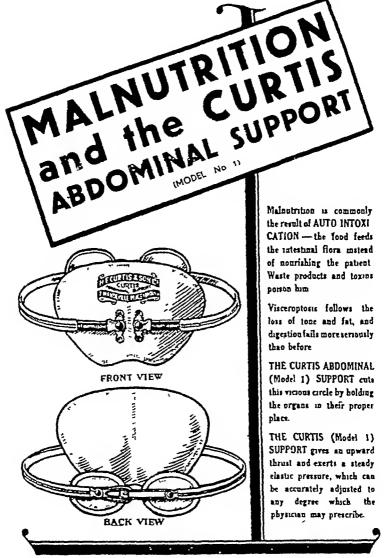


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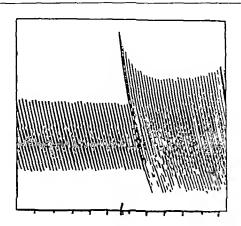
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THE PRACTITIONER

APRIL

The Clinical Aspects of Psittacosis.

By A P THOMSON, MC, MD, MRCP

Assistant Physician to the General Hospital and Physician to the Children's Hospital, Birmingham

ROM the clinical point of view, human cases of psittacosis may conveniently be described in two groups (1) in which the course is so distinctive that a fairly definite diagnosis is warranted by the symptoms and physical signs, and (2) in which the diagnosis is suggested mainly by the history of contact with sick birds

The incubation period appears to be about ten days, but has not yet been accurately determined. The bird responsible for the infection is usually a new importation from South America, but it is certain that West African birds may also carry the disease

Group 1—In the first group the patient rapidly develops symptoms of general infection—moderate fever, a furred tongue, headache and malaise, associated occasionally with nausea and vomiting, and more rarely, with epistaxis and diarrhea. In the course of two or three days the temperature rises to a high level—commonly to about 104°—but the pulse remains comparatively slow, often less than 100 per minute. The headache becomes intense usually it is occipital in distribution, radiates down the back of the neck, and is sometimes associated with slight cervical rigidity

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ASPECTS OF PSITTACOSIS

high-pitched tubular breath-sounds may be found over large areas of the lungs and only when these become very extensive is there any increase in the pulse or respiration rate or any cyanosis A few days later, towards the end of the second week of illness, a further remarkable change in the physical signs sometimes occurs, for the percussion note over the affected areas becomes completely flat and all breath-sounds disappear. The onset of pleural effusion is naturally suspected, but there is no displacement of the apex beat and repeated explorations of the chest have never yielded more than a trivial quantity of rusty fluid and more commonly none at all has been found From the clinical evidence it seems that massive consolidation of the lung involving the smaller bronchi must occur and it was gratifying to have this conclusion confirmed by Professor Haswell Wilson in a case examined after death at the General Hospital, and also by other observers

In the case examined by Professor Wilson the whole of the left upper lobe and part of the right lower lobe were completely consolidated The lung in these areas was not increased in size, was not marked by the ribs, and one section was of a dusky red colour and of a dry, almost crumbling, consistence was not any evidence of suppuration, and the appearances were quite unlike those of ordinary lobar pneumonia or bronchopneumonia There were a few minute petechial hæmorrhages beneath the visceral pleura, but the only evidence of pleurisy was a small patch of recent fibrinous exudate over an area of ordinary bronchopneumonia at the edge of the larger consolidated area The alimentary tract was normal the spleen was slightly enlarged, congested and very soft The histological examination of the lungs showed that the affected areas were uniformly consolidated the exudate was fibrinous, cells were relatively scanty

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and photophobia At this stage there may be intermittent delirium, but usually the patients are mentally alert and sensible

Examination during the first week of illness does not reveal anything on which to base a diagnosis, typhoid infection is often suspected, a Widal test may prove positive—as it did in three cases in my series—but usually it is completely negative occasional occurrence of a positive Widal in the early stages of the disease is an important point, for it is clear that an initial error in clinical diagnosis may thus receive support from the laboratory, and I have no doubt that in the past cases of psittacosis have been regarded as unusual instances of typhoid the three cases in my series in which a positive Widal was obtained, the agglutination occurred at unusually high dilution at a very early stage of the illness, and the positive result was obtained with one member only of the typhoid group, with curiously little agglutination of the closely related organisms It is proper to suggest, therefore, that a strongly positive Widal, limited to one organism within the first few days of illness, should raise the suspicion of psittacosis—particularly if a blood culture prove negative and the onset has been unduly rapid for a case of typhoid Towards the end of the first week of illness a troublesome cough develops and patchy signs of bronchitis are found expectoration is usually absent or very scanty. Within a few days the bronchitic signs are succeeded by those of frank consolidation and one of the most striking features of the disease is the unobstrusive, almost stealthy, way in which the pneumonic condition develops Without any well-marked change in the general condition of the patient, without evidence of respiratory distress or pleurisy, without pain and without sputum, an impaired percussion note and

ASPECTS OF PSITTACOSIS

and an occasional trace of albumin, there are no urinary symptoms Examination of the blood usually shews a leucopenia.

The important features of this group of cases, therefore, are febrile illnesses at first suggesting typhoid but usually more rapid in its onset, the appearance of bronchitis followed by signs of pneumonia without the pleurisy or respiratory distress characteristic of the ordinary types of that disease, and later, massive consolidation involving the smaller bronchi with a markedly impaired percussion note and absence of breath-sounds suggestive of pleural effusion which the normal position of the apex beat and negative exploration of the chest prove to be absent So distinct is the course of the condition that a confident clinical diagnosis of psittacosis is justified, and on several occasions in my experience the definite history of contact with sick parrots or love birds has only been elicited by careful subsequent enquiry, sometimes after the death of the patient A case brought to my notice quite recently may be quoted as an illustration of this point, it was reported by Professor Douglas Stanley at a meeting of the Midland Medical Society

The patient, a woman, died in hospital after an illness in all respects similar to that described and the post-mortem examination proved that in essentials it was identical with my own fatal case that came to necropsy. At first no history could be elicited of any contact with sick birds, but investigation later showed that the patient was a charwoman who cleaned the premises of a breeder of budgerigars, half of whose stock had recently died of a disease contracted from newly-imported birds. Shortly before the onset of her illness the women was given two of the love birds by her employer and kept them on a shelf immediately above the table on which she prepared and ate her food. One of these birds died shortly before her own death. None of this history was available at the time when Professor Stanley made the clinical diagnosis.

GROUP 2—Since attention has been directed to the matter, a considerable number of human cases of obscure febrile illness have been attributed to

THE PRACTITIONER

and almost entirely mononuclear There were scattered areas of congestion and hæmorrhage and here and there small patches of cedema without fibrin There was no selective perivascular or peribronchial distribution of the exudate as occurs often in influenzal pneumonia. The smaller bronchi were filled with desquamated epithelium. the larger bronchi showed a similar desquamation but were quite empty I have recently had a letter and some sections of the lung from Dr McClachlan, of Pittsburg, from which it appears that the lesion found post-mortem in one of his cases is similar to that described by Professor Wilson and a more recent case in the Midlands was also identical

This massive pulmonary consolidation may persist while the temperature is falling by lysis in the third week of the illness and remain for some days after it has become normal Eventually it appears to clear up rapidly and completely and resolution is accompanied by fine crepitant râles

The general condition of the patient seems often to deteriorate while the temperature is falling—the prostration becomes more marked probably in consequence of toxic involvement of the central nervous system and a curious immobility of the face suggestive of Parkinsonism has frequently been noticed. In very severe cases the patient has been stuporose and incontinent for ten days continually, even when the temperature has fallen to normal and the active phase of the infection seems to be past

On the whole the alimentary symptoms have been slight Distension is at times very severe but nourishment is usually well taken and the stools, though occasionally loose and offensive, have shewn nothing of note. In my series the spleen has been palpable once and in that instance only for a few hours. Rose spots have not been found. Apart from incontinence

ASPECTS OF PSITTACOSIS

Gow5 show the same diversity of symptoms and severity The noteworthy features in this group were the prevalence of epistaxis during the early stages, the tendency to diarrhoa with collapse and the special liability to pulmonary complications towards the end of the first week In two cases the sputum contained blood and cultures from it showed the presence of a variety of organisms Micrococcus catarrhalis, streptococci and staphylococci in one case and in the other Gram-positive diplococci, Gramnegative bacilli in films and pneumococci and Friedlander's bacilli in about equal quantities on culture The description of the morbid changes is incomplete, but according to the report of the preliminary investigation the lesions differed markedly from those in my case for "the main condition broncho-pneumonia, the cytology of the alveoli in the actual areas of consolidation showing no unusual characters" The evidence connecting some of these cases with the sick parrot is in some instances slightthus Case 5 "did not see the parrot at any time and did not go into the flat " in which it was kept, and Case 2 "never saw the parrot at any time but shook hands twice with its owner" who never had the disease Hutchison⁶ has not yet published a description of the cases under his observation at the London Hospital, but in the discussion at the Royal Society of Medicine, in January, he said "The cases all suggested a typhoid infection in their general character Headache was often a prominent symptom at the onset and m a few cases there was epistaxis The pulse tended to be slow and the spleen was never palpable, but in at least two there were small rose spots Diarrhea was never prominent The lungs became affected more or less in all, but in no case have I seen the very dense consolidation spoken of by Dr Thomson Usually there were moist sounds at one base or both

psittacosis, in the majority of which the signs of the fully-developed condition that I have just described have been lacking I have recorded several instances of this type1 and as there is neither sufficient clinical evidence nor, in the present state of our knowledge, any satisfactory bacteriological or serological test to distinguish them clearly, I place them loosely in a second group in which the diagnosis is suggested mainly by the history of contact with sick birds clinical course of these cases has varied widely 1927, Stolkind² described two cases very briefly, both of them had definite pneumonic consolidation but there is no mention of the disappearance of the breath-sounds and the report of the post-mortem examination of one of them is, unfortunately, meagre Warrack's case³ had fever lasting twenty-five days but only came under observation on the nineteenth day (he had previously been at sea). His general appearance suggested a typhoid septicæmia, but the spleen was not enlarged, there were no rose spots, and the Widal reaction was negative The pulmonary signs were limited to those of basal bronchitis when he first came under observation, but from the twenty-third to the twenty-sixth day "there was general pleurisy affecting the left lung" Radford describes four cases and mentions a fifth, all infected from the same source Notwithstanding this, the symptomatology varied widely. in two the symptoms suggested typhoid fever in three pulmonary symptoms only were present, in one a frank lobar pneumonia "without the violent respiratory symptoms of the pneumococcal form of that disease", in another diffuse râles in the lungs, the particulars in the third are not stated, but there is a note that "none showed the solid condition of the lung described by Dr Thomson" I have observed similar variation in patients infected from a single bird The cases described by Horder and

ASPECTS OF PSITTACOSIS

Gow5 show the same diversity of symptoms and severity The noteworthy features in this group were the prevalence of epistaxis during the early stages, the tendency to diarrhea with collapse and the special liability to pulmonary complications towards the end of the first week In two cases the sputum contained blood and cultures from it showed the presence of a variety of organisms Micrococcus catarrhalis, streptococci and staphylococci in one case and in the other Gram-positive diplococci, Gramnegative bacilli in films and pneumococci and Friedländer's bacilli in about equal quantities on culture The description of the morbid changes is incomplete, but according to the report of the preliminary investigation the lesions differed markedly from those m my case for "the main condition broncho-pneumonia, the cytology of the alveoli in the actual areas of consolidation showing no unusual characters" The evidence connecting some of these cases with the sick parrot is in some instances slightthus Case 5 "did not see the parrot at any time and did not go into the flat" in which it was kept, and Case 2 "never saw the parrot at any time but shook hands twice with its owner" who never had the disease. Hutchison⁶ has not yet published a description of the cases under his observation at the London Hospital, but in the discussion at the Royal Society of Medicine, in January, he said · "The cases all suggested a typhoid infection in their general character Headache was often a prominent symptom at the onset and in a few cases there was epistaxis. The pulse tended to be slow and the spleen was never palpable, but in at least two there were small rose spots Diarrhea was never prominent The lungs became affected more or less in all, but in no case have I seen the very dense consolidation spoken of by Dr Thomson Usually there were most sounds at one base or both

with some impairment of note only. In one case there was pleurisy, which was verified post-mortem along with a peculiar form of pneumonic consolidation apparently like that which Dr Thomson has described"

CONCLUSION

It is clear that the symptoms and signs of the human illness that may ensue after contact with sick birds may vary very considerably In the first group described above the features are so characteristic that a positive clinical diagnosis is possible without a definite history of exposure to infection, for I do not know of any other condition that simulates it In this connection it is worthy of record that in several of these cases an organism like B facalis alkalignes in its sugar reactions has been recovered from the lungs and also from a bird responsible for the infection of one of them Forrester' has recorded the recovery of a similar organism from the blood of a patient infected by the same parrots which caused the death of my case that came to autopsy cultures from the lung of this case yielded an identical bacillus fessor C J. Lewis's experimental work with this organism has not supplied any evidence of primary toxicity, but it may have some importance as a secondary invader in determining the clinical course and the final pathological lesions

In the majority of cases, however, the clinical picture is not sufficiently definite to warrant a diagnosis apart from the history of contact with sick birds, but given that fact, diagnosis, with a certain amount of experience, is not difficult. The illness, at the beginning suggests a typhoid septicæmia but of unusually rapid onset—the spleen does not become palpable, rose spots are rare and the alimentary symptoms are usually slight apart from some initial

ASPECTS OF PSITTACOSIS

vomiting. Later on the lungs are nearly always involved to some extent, but the usual distressing symptoms of pneumonia are absent

The variation of the severity and type of the illness, whatever the actual infecting agent may prove to be, possibly depends on a number of factors It is probably true that the age of the patient is important, for children certainly seem to suffer less than adults infected at the same time and from the same source The prognosis in the elderly is always grave Apart from the obvious considerations of general physical condition, it seems to me that the extreme diversity of the cases is due to the presence or absence of secondary infection. In most of the clinical and pathological descriptions of pulmonary complications in true typhoid infection it is clear that the lesions are attributable to invasion by organisms usually associated with pneumonia and the presence or absence of this factor may well influence the course of psittacosis

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² Stolland, E S Med Press and Circ, 1927, clxxiv, 259 ³ Warrack, J S Brit Med Journ, 1930, 1, 111

⁴ Radford, Mary C Ibid, 1930, 1, 33 ⁵ Horder, T and Gow, A E Lancet, 1930, 1, 442

⁶ Hutchison, R Proc Roy Soc Med, 1930, xxiii (Med Sect.), 63

' Forrester, A T W Lancet, 1930, 1

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Congenital Developmental Familial Diseases, and some Familial Anæmias and Splenomegalies.

By F PARKES WEBER, M.A., MD, FRCP Senior Physician to the German Hospital, London

N biology, according to the "New English Dictionary,"1 the term "mutation" is used for the kind of change which results in the production of a new species—in contrast to the term "variation" "Mutation" was applied by the Dutch botanist Hugo de Vries (1901)2 to the process by which, according to his theory, a new species is suddenly produced by a departure from the parent type The word is also used for a species resulting from this process mutation "is allied to its ancestor as a branch is to a tree " "Discontinuous variation," as the term was used by William Bateson in 18943, is practically the same biological process as mutation De Vries' botanical observations gave the chief support to the theory that new races and species originated discontinuously, and not gradually and merely by selection, continuous variations and the survival of the The results of mutation can only survive and reproduce their kind if suited to their environment and therefore "fit to survive" But whether a given mutation is or would be "good" or "bad," may be hard to decide or hard to predict

In medicine in more recent times it has been assumed that it is by a similar process of mutation that the various congenital-developmental hereditary and familial abnormalities in form (malformations), structure (dysplasias and dystrophies)⁴, or function (including metabolic and mental abnormalities) arise, and for brevity's sake such abnormalities themselves have been called "mutations" It is obvious that by ordinary clinical and pathological study no sharp dividing line can be drawn between variations and mutations, for what seem to be but slight variations may be transmitted just as the great mutations

Mutations may be obvious or latent or only potentially present at birth and may not manifest themselves till early childhood, or puberty, or later Many are usually spoken of as diseases, and the list of those that first show themselves at various periods after birth-though of course potentially present at birth and in intra-uterine life-include all the "delayed" (sometimes still though wrongly termed acquired") types of the congenital-developmental "atrophies" and "dystrophies," such as primary muscular dystrophies and the "diseases" of the nervous system for which Sir William Gowers originally introduced the word "abiotrophy" For the latter term one might perhaps now substitute "dysbiotrophy," since the inferior or connective-tissue elements of a part may or may not become excessive when the essential or nobler elements atrophy Kinnier Wilson's progressive lenticular degeneration is perhaps such a combined "dysbiotrophy" of the lenticular nuclei and the liver, and it now appears that the hepatic constituent of the combined condition may after all give rise to obvious clinical symptoms By the way, cases of "Wilson's disease" represent a form of hepatic cirrhosis, which is sometimes familial 5 Formerly most of the few known examples of familial

cirrhosis of the liver were thought to be of Hanot's type.

Abnormalities (strictly speaking, including improvements)6 and "diseases" of the mutation class are constantly arising in animals and human beings, as de Vries found that they arose in plants In this way some of the supposed "first cases" in a family can be explained, but others are only apparently first cases owing to imperfect knowledge of the family history Some types arise more often than others, but the different familial groups of the same type may vary considerably from each other, so that it can be said (perhaps especially in regard to familial congenital-developmental neuro-muscular "diseases") that each family develops its own modification of a type or may even "develop a separate type of its own " Moreover, even in the same family, when the whole or a large part of the family can be examined (as has been done in regard to hemolytic icterus on the Continent, and combined congenital ectodermal defect in America?,) it is found that the disease may vary greatly in degree and even apparently in the kind of symptoms in the different affected individuals of the family

In hereditary telangiectasia of the skin and mucous membranes (Osler, etc.) epistaxis may be the chief symptom, the cutaneous telangiectases do not usually appear before the age of about 23 years ⁸. The Milroy-Nonne hereditary ædema⁹ may be present at birth or develop later, and in some cases only part of one extremity is affected whilst in other members of the same family a whole extremity or more than one extremity may be affected. In some "diseases" of the congenital-developmental familial class the first manifestations may follow an infection, an intoxication, or a trauma, which apparently acts as an exciting cause, in the absence of which the disease

FAMILIAL DISEASES

might possibly have remained latent, in fact, such exciting agents may be absolutely necessary to reveal latent potentialities of reaction which may be familial, such as certain anaphylactic reactions

From the hæmatological point of view the most striking examples of mutations are sickle-cell (falciform or drepanocytic) anæmia and congenital hæmolytic jaundice The former has as yet been observed only in negroes, with the "sickle-cell trait" It is apparently due to a structural abnormality of the erythrocytes which is manifested, though not explained. by the "sickle-cell trait," that is to say, by the falciform shape that the erythrocytes assume in the blood of symptomless cases after withdrawal from the body It has been said that from the moral, religious and mental point of view much may be revealed by the manner in which a man dies Certain it is nowadays that something may sometimes be learned about his physical constitution by the behaviour of his red blood cells in breaking up under various conditions after they have been withdrawn from his body

This is equally well illustrated by the second above-mentioned hæmatological group, congenital hæmolytic jaundice (and anæmia). It was Chauffard who first showed that these cases could often be recognized by an abnormally low resistance (excessive "fragility") of their red blood cells towards hypotonic salt solutions, and this discovery led to the correct diagnosis of many cases previously incorrectly classified or half-correctly labelled under various other headings, such as familial Hanot's disease, "familial cholæmia," familial splenomegaly, splenomegalic anæmia, splenic anæmia, Banti's disease, familial hepatic currhosis with splenomegaly, etc

However, this abnormal "fragility" of the erythrocytes towards hypotonic solutions does not

explain their fragility within the patient's body, where such "hypotonic" fluids or "juices" can never be encountered Moreover, though certainly a most useful clinical hæmatological sign, it is not a constant finding in all cases. It may be absent at times, if not permanently, in more or less affected members of a "congenital hæmolytic" family. Thus Gansslen, Zipperlen and Schutz, in their great monograph on hæmolytic jaundice and the "hæmolytic constitution," found that abnormal fragility of the erythrocytes was absent in 10 per cent of what they called "compensated cases"—quite apart from extremely slight (incomplete) cases.

In apparently "hæmolytic" familial cases recently recorded by Dr E A Cockayne¹¹ at the Children's Section of the Royal Society of Medicine, there was no abnormal fragility of erythrocytes, and O Naegeli¹² admits that this sign may be negative at times, though even in such cases it may become positive under altered conditions, such as in association with the process of compensatory erythrocytosis at high altitudes

Cases of the congenital hemolytic jaundice group may be divided into (a) Those in which the main clinical feature is the jaundice, who, according to Chauffard, "are more jaundiced than ill", (b) those in which the animal is the "presenting" feature, at all events for the time, and who might be said to be "more animic than jaundiced" and sometimes are not obviously jaundiced at all, even though their bloodserum is certain to contain more "blood-bilirubin" than the normal maximum (giving a too highly positive indirect Hijmans van den Bergh's reaction), (c) those in which the splenomegaly is for the time the clinical "presenting" sign When only one of these signs is obvious (whether the splenomegaly, the animia or the jaundice) and when the other signs, if present, have been carelessly overlooked, an error

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of diagnosis is not unlikely to be made in the absence of hæmatological examination and without family history. Obvious clinical jaundice may be absent for years. A case may pass from one to another of these three groups. In typical ordinary cases all three signs are more or less obviously present together.

think that the fundamental observers abnormality is in the red blood corpuscles, and this fundamental abnormality must, of course, not be confused with the usual appearances connected with excessive blood-regeneration By ordinary examination there seems to be microcytosis, but by special examination Naegeli has shown that the apparent "microcytes" compensate (or more than compensate) for the shortness of their maximum diameter by being thicker, that is, of a more globular or spherical shape, than ordinary erythrocytes. It is assumed that some peculiarity of their structure must likewise be present that reduces their resistance to destruction in the spleen and so accounts for the usual success of treatment by splenectomy

One might possibly compare the abnormal inequality in the size of the red cells frequently observed in hæmolytic jaundice cases with the inequality of the striped muscle fibres which has been noted in some congenital-developmental muscular dystrophies

It is not astonishing that with a congenital-developmental abnormality, such as hæmolytic jaundice, other congenital-developmental abnormalities may be occasionally associated, such as Turmschädel (turriform or tower head). This particular association has been especially noted by Gansslen and Naegeli. As I have myself had occasion to observe, some degree of Turmschädel is by no means iare in the region of Tubingen, where Gansslen made his interesting observations on familial hæmolytic jaundice, and it is not surprising, therefore, that

both these familial abnormalities should be occasionally associated in the same families Similarly, Curtius and Strempel have recorded the occurrence in one family of two separate remarkable familial developmental diseases as a result of intermarriage, namely, Recklinghausen's neurofibromatosis and epidermolysis bullosa ¹³

Infantilism, which was present in a boy, whose case I recorded, is very rarely if ever etiologically connected with familial hæmolytic jaundice. In my case there was in fact a question of congenital syphilis ¹⁴

A special tendency to chronic ulceration of the legs has been noted in some hæmolytic jaundice families (by H Batty Shaw, J W McNee and others). What the exact connection is has, I believe, not yet been discovered. McNee has suggested that the ulcers are due to diminished resistance and a low virulence infection.

In the familial series of cases of hæmolytic jaundice which I described with Dr G Dorner in 1910,15 the grandfather (who had been jaundiced all his life) was said to have died at the age of 76 years (wrongly printed as 70) as a result of ulceration of the leg One of his granddaughters (C2 of the description in the Lancet) I saw again owing to the kindness of Dr E Cautley in the Metropolitan Hospital in 1916, when she was aged 20 years. She had had an ulcer over the lower part of the right tibia, which she said "came of itself" A brother (C3 of the Lancet account), aged 12 years, who was the least jaundiced of the affected members of the family in 1910, some time after heavy artillery work during the Great War, had to be admitted to St Bartholomew's Hospital, with great splenomegaly and severe anæmia I saw him there by the kindness of Dr J H Drysdale His spleen was excised on January 21, 1921 by Mr G E Gask with satisfactory results.16 At the upper pole of the excised

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spleen there was an area of anæmic infarction.¹⁷ In June 1922 Dr. Drysdale told me that this patient had lately had cerebral symptoms—possibly due to slight thrombotic disturbance. At first I thought that a local vascular thrombotic process might be the immediate cause of chronic leg ulcers in hæmolytic jaundice cases, which may also constitute a feature in cases of sickle-cell anæmia. On the whole, in most cases (familial hæmolytic jaundice and sickle-cell anæmia) diminished resistance and a local infection of low virulence (following slight traumata, abrasions, etc.), as suggested by J. W. McNee, is the most probable cause of the leg ulcers.

There can be no doubt that in some cases of familial hæmolytic jaundice (anæmia) the "disease" is latent at birth and during early childhood, that is to say, there is no obvious jaundice or other sign present that calls the attention of the parents to the presence of any abnormality I do not know of any record of a post-mortem examination in a new-born case of undoubted familial hæmolytic jaundice, but Dr L S Baker has kindly allowed me to state that m 1925 he made a post-mortem examination on a new-born child with jaundice, enlarged spleen and diminished osmotic resistance of the erythrocytes A family history of hæmolytic jaundice, however, could not be obtained A blood-film showed great excess of nucleated red cells, and there was evidence of far too much erythroblastic activity in the liver The amount of free iron in the liver and spleen showed that blood-destruction had likewise been excessive

It seems to me that Buchan and Comrie's familial "Cases of Congenital Anæmia with Jaundice and Enlargement of the Spleen," were probably allied to "familial interus gravis neonatorum," such as have been discussed by Rolleston, I Pfannenstiel, and others in England and abroad, and recently

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(especially in regard to the pathogeny and successful treatment) by A C Hampson.²³

A very remarkable case of congenital constitutional jaundice is that of a man (G $\, T \, D$), now aged $63\frac{1}{2}$ vears, whom I have seen from time to time during the last thirteen years Excepting for considerable (somewhat variable) jaundice and chronic deafness (due to otosclerosis) and slight nystagmus, he gives the impression of an active, hard-working, hale, elderly man, and has never been seriously ill He has scars from leg-ulcers (left leg) from which he suffered in 1910 It is because he wished to insure his life that in January, 1917, through the kindness of Dr Otto May, I was first able to examine him Apart from a very strongly positive indirect Hijmans van den Bergh's reaction for bilirubin in the blood-serum, examination of the blood, urine and viscera shows nothing abnormal There is no bilirubin or excess of probilin or uribilinogen in the urine The osmotic resistance of the erythrooytes is neither higher nor lower than that in ordinary individuals There is no enlargement of the spleen, liver or superficial lymphatic glands and no xanthoma or cutaneous pruritus The Wassermann reaction is negative

From time to time I have demonstrated the case at the Royal Society of Medicine,24 but have never seen or heard of any exactly similar case, unless, perhaps, certain doubtful cases of congenital jaundice in adults before the modern methods of examination of the blood and blood-serum had been introduced that examination of stained blood-films did not suggest hemolytic jaundice, but further repeated examinations of the erythrocytes might possibly reveal some abnormality in shape, as in the erythroovtes of cases of congenital hæmolytic jaundice, according to Naegeli's views Anyhow, I suppose the jaundiced condition in his case must be regarded as a mutation, though apparently his jaundice was not passed on to any of his four children (two of them are dead) 25 In his case the jaundice has been harmless, and there is no evidence that the mere excess of blood-bilirubin in the circulating blood (which is the cause of the strongly positive indirect Hijmans van den Bergh's reaction in the serum) ever does any harm per se It is no wonder that the man (from his limited point of view) complains very much of having had to pay a large extra premium for his life assurance

Probably the mutation in this case can no more be regarded as a "disease" than can the exceptional cream-colouring of the wings of the common "clouded orange" butterfly (Colias croceus or Colias edusa) which was relatively frequently observed during the summer of 1877, when I was collecting butterflies in the clover fields near Folkestone ²⁶

Of the various recorded familial groups of consti-

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tutional anæmia or of permicious or other types of anæmia on a familial constitutional basis one of the most interesting is that recorded by G. Fanconi, in 1927, from Professor Feer's clinic in Zurich.27 Three children (brothers) were affected with anæmia of a somewhat permicious-like type. These were also characterized by microcephaly, good intelligence, brown pigmentation of the skin, the occurrence of cutaneous hæmorrhages, testicular hypoplasia, convergent strabismus, and exaggerated tendon reflexes In spite of the blood-picture of pernicious anæmia there were no signs of excessive hæmolysis Besides this family group, and for comparison with it, Fanconi described a case of progressive muscular dystrophy in a boy, aged 12 years, with microcephaly, cutaneous pigmentation, testicular hypoplasia, and a temporary typical blood-picture of pernicious O. Naegeli refers to the three brothers described by Fanconi as representing a hitherto undescribed familial constitutional type of anæmia 28 With Fanconi's cases I would compare a remarkable familial constitutional anæmia group shown by Dr F. M Allen at the Belfast Meeting (1927) of the Association of Physicians of Great Britain and Ireland, although in Allen's cases the anæmia was not of the "permicious type" A brother, aged 18 years, had a somewhat myxœdema-like infantile appearance (though his pubic hair was normally developed), slight laundice and enlargement of the liver and spleen There was no evidence of syphilis in the family. This series of cases has not yet been published by Dr Allen. whose permission I have to refer to them.

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¹ New English Dictionary, Oxford, 1908, vol vi, p 796

de Vries, H., Die Mutationstheorie, 1901

Bateson, W., Materials for the Study of Variations, 1894, p. 15.
For instance, primary muscular dystrophies, "congenital

ectodermal defects" (cf, F P Weber, Brit Journ Child Dis, London, 1929, XXVI, 270-275), cystic dysplasia of kidneys and liver (cf, F P Weber, Trans Med Soc, Lond, 1927, L, 107-111), and the various "abiotrophies" (Sir William Gowers) of the nervous

system

 5 Cf, the cases described by Stanley Barnes (Proc. Roy. Soc. Med., 1924, xviii (Sect Neurol, 34), in one of which (Case 3) the hepatic affection seems to have preceded the lenticular affection Cf, also Lhermitte and Muncie, La Cirrhose familiale splénomégalique forme hépatique de la dégéneration hépato lenticulaire," Presse méd, Paris, 1929, xxxvii, 1495

Which changes when they first occur should be regarded as good and which as bad it must, of course, often be impossible to

decide, as has been already remarked in this paper

7 See the large family group (119 cases) described by H. R. Clouston, Canadian Med Assoc Journ, 1929, xxi, 18-31 I have suggested the name "Guildford's disease" for familial "combined ectodermal defects" of the kind, after S H Guildford, who reported the first known case in 1883

⁸ For an account of "hereditary teleangiectama" see F P Weber, Lancet, 1907, 11, 160, and Brit Journ Child Dis, London, 1924, xxi, 198 Sir William Osler's first paper was published in the

Johns Hopkins Hospital Bulletin, 1901, \$11, 333

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10 Gänsslen, Zipperlen and Sohütz, Deut Arch f llin Med,

Leipzig, 1925, cxlvi, 1-46

11 Cockayne, E A, Proc Roy Soc Med, 1929-30, xxm (Sect, Dis Child), p 19, and G H Gange and E A Cockayne, ibid, 1928-29, xxii, p 94 Cf also the jaundiced brothers shown by A. Abrahams, Proc Roy Soc Med, 1928, xxi, (Clinical Section), 106

12 O Naegeli, Blutkrankheiten, Berlin, 1923, 4th Edition, pp 339-345 See also O Naegeli, Allgemeine Konstitutionslehre, Berlin, 1927,

p 68 (on "Constitutional Hæmolytic Anæmia")

13 Curtius, F, and Strempel, R, Dermat Ztschr, Berlin, 1928, h, 401-416 On the occasional association of Recklinghausen's neurofibromatosis with other congenital-developmental abnormalities, see F P Weber and Perdrau, Quart Journ Med, Oxford, 1930, xxm, 151

14 Weber, F Parkes, "The question of Infantilism as a Complication of Congenital Hæmolytic Jaundice," Brit Journ Child Dis,

London, 1926, xxiii, 185

Weber, F Parkes, and Dorner, G, Lancet, 1910, 1, 227-232

16 See the account by E Coldrey, St Barth Hosp Journ , London, 1921, xxvm, 106

17 See description of the excised spleen in the account of the specimens added to the Museum of St Bartholomew's Hospital (London) during 1921

18 Hem, McCalla, and Thorne, "Sickle Cell Anaemia," Am

Journ Med Sci, Philadelphia, 1927, clxxiii, 763-772

Buchan and Comrie, Journ Path and Bact, 1909, xiii, 398 Dr Comrie has kindly informed me in regard to their familial

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series that one child was subsequently born in the same family, who developed the same condition and died almost immediately after birth. The organs were carefully examined, but nothing further was found, and the blood showed no abnormal fragility of the crythrocytes.

²⁰ The occurrence of Kernilterus in some of the published cases and the nervous symptoms in some of the survivors are of especial

interest

²¹ Rolleston, Humphry, Brit Med Journ, 1910, 1, 864, and The Practitioner, 1920, civ, 1-7

22 Pfannenstiel, Muenchen med Wchnschr, 1908, lv, 2169, 2233

23 Hampson, A C, Lancet, 1929, 1, 429

21 Weber, F Parkes, Proc Roy Soc Med, 1917, x (Chn Sect), p 13, 1bid, 1923, xvi (Sect Med), 81, 1bid, 1928, xxi (Chn. Sect), p 3

25 No family history of jaundice or anæmia can be obtained

variation (aberratio helice) of Colias croceus is a sex-limited dominant and breeds as such on Mendelian lines. Just as human hæmophilia manifests itself only in males, though females transmit it, the helice colouring only occurs in females, though orange-coloured males, that are homozygous for helice may transmit the cream-colouring (helice character) to their offspring (that is to say, only female offspring manifesting it)

27 Fanconi, G., Jahrbuch für Kinderheilkunde, Berlin, 1927,

vol 117, p 257

²⁴ Naegeli, O, "Die Analyse der Anämien," Jahreskurse f Aerzil Fortbildung, München, 1926, in, pp 30-48

Some Aspects of Calcium Metabolism in Relation to Therapeutics.

By J CLIFFORD HOYLE, M.D., Ernest Hart Scholar (From the Pharmacological Laboratory, Cambridge)

HE reputation of most therapeutic agents varies from time to time, and in no case has this been more striking than with calcium. Recent observations, particularly on the experimental side, have extended knowledge of the part played by calcium in the body both in normal and diseased states. of the earlier claims have not been sustained by this increased knowledge. Calcium plays a most important part in regulating the activities of the body. It is essential to all protoplasm, it is required for the action of ferments, such as rennet and fibrin-ferment, and it retards inflammation by constricting the blood vessels and by diminishing the permeability of cell membranes. Calcium ions are necessary for the normal activities of all nervous and muscular tissues; in their absence potassium and magnesium ions exert their poisonous effects. Calcium phosphate and carbonate form the chief constituents of bones to which they give rigidity.

CALCIUM IN THE DIET.

Variations in the amount of calcium in an ordinary diet take but a small part in the etiology of disease. A deficient supply of calcium frequently occurs, but its effects are generally slight. Only in one rare type of osteomalacia, namely that occurring during famines, is calcium deficiency in the diet directly responsible.

for the disease; and patients suffering from this condition recover when calcium and phosphorus are added to the diet An adult requires about 0.5 gm. of calcium daily for normal metabolism, or, roughly, the quantity present in a pint of milk; this is readily provided by an average diet It has, however, been shown¹ that the diets of many people in America contain only the bare minimum of calcium required to balance excretion, so that if any condition of diminished absorption, increased excretion, or a greater demand for calcium by the tissues arises, the supply would be insufficient. It is known that such an increased demand may occur from time to time. Pregnancy is an example; during the first four months of gestation the fœtus requires only about 0.006 gm. daily, an amount which is quite negligible After the seventh month this increases about a hundred times and at term 0.6 gm. per diem is required. This implies that during the last months of pregnancy the mother needs at least twice her normal supply of calcium, and we know^{2, 3} that at this period, under favourable conditions, the body stores large amounts of calcium and other mineral elements, presumably to act as a reserve. If sufficient calcium is not provided, it is withdrawn from the mother's bones to supply the needs of the fœtus It is not unlikely that this is the explanation of those mild cases of osteomalacia which occur during pregnancy and tend to recover spontaneously at the close of lactation. It is probable that the additional amount required during pregnancy is not fully provided under ordinary conditions, since a fall in the serum calcium during pregnancy is frequent, particularly in the later months4 It is therefore important to ensure that the supply be ample; it may be readily increased by taking milk, or by the simple expedient of diluting the table salt with an equal amount of chalk.

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CALCIUM ABSORPTION

The amount of calcium available for the body from the diet depends upon absorption from the small The most important factors known to control this are the relative proportions of calcium, phosphorus, and fat present in the diet, the acidity of the intestinal contents, and a sufficient supply of vitamin D Many observers have shown that an excess of phosphate in the diet decreases calcium absorption, as would be anticipated from the insolubility of tri-calcium phosphate. In young animals this factor is so great that a diet in which the phosphate is much in excess of the calcium, though both may be above the requirements, usually produces defective bone formation and rickets In the patient lack of balance between phosphorus and calcium in the diet has little significance, but defective balance between fats and calcium is important. An excess of fat in the diet interferes with the storage of calcium because the calcium soaps which are formed are not absorbed and are excreted in the fæces. Normally 20 to 30 per cent of the calcium intake in infants is excreted in the fæces as calcium soaps9. When the amount of calcium in the diet is reduced, diarrhœa occurs, and there is a coincident decrease in the calcium soaps and increase in the free fatty acid in the stools. Administration of calcium stops the diarrhea and at the same time raises the amount of calcium in the fæces Moreover, it has been shown that in the case of young infants taking a diet of unmodified cow's milk, the calcium soaps formed may be a cause of severe It may be noted that cow's milk contains six times more calcium than human milk.

The close relation between fat and calcium absorption from the gut plays an important part again in cœliac disease in children and sprue in adults. In the former

During lactation the demand for an increased supply of calcium continues, and it is easily shown that in animals lactation causes a considerable decrease in the percentage of calcium in the tissues⁵, such experiments also show that the amount of calcium in the milk remains constant although the supply in the mother's diet is less than that required to balance loss. The sacrifice is made by the mother and not by the child, indeed, if excess of calcium is provided in the diet, the child gains no advantage since the amount present in the mother's milk remains the same

Calcium accumulates in the body of the fœtus, especially during the last weeks of gestation. If the child is born prematurely this store is not present. Hamilton has recently shown⁶ that the ratio of the amount of calcium in the body to the body weight decreases during the first four months in normal human infants. as the skeleton increases in proportion to the body weight he considers that the child uses the store of calcium present at birth for skeletal development during its early life. The practical significance of these observations is that they explain why premature infants invariably suffer from nickets, and also why normal infants rarely get nickets before they are four months old.

From birth throughout the entire growing period, storage of calcium in the bones continues, and it is accepted that the normal child stores about 0 2 to 0 6 gm of calcium daily^{7,8} This means that the allowance for a child must be greater than that for an adult, and that the quantity required can be supplied only by a diet which consists largely of milk or foods prepared with it, since too large a bulk of meat or cereals would be required to afford the necessary minerals Sherman recommends that every child should take a litre of cow's milk daily

contain an excess of fat, mainly present as fatty acids and calcium soaps. Defective calcium absorption probably occurs in most of the cases, as is suggested by the low serum calcium and the frequency of latent or active tetany It has been claimed that the administration of calcium salts and parathyroid extract produces striking improvement in the entire chinical picture of the disease. Other observers have been more cautious in attributing the beneficial results to this treatment, whilst others, again, have denied that it has any additional value to dietetic treatment alone. assessing the present position it should be emphasized that in many of the cases in which marked benefit has been said to accrue from the administration of calcium salts and parathyroid, a strict milk diet has been enforced at the same time, and this is known to be of great value Scott's original conception17 of the manner in which parathyroid extract was supposed to benefit the condition through its "detoxicating" action is not true. Finally, as dried commercial preparations of parathyroid extract are almost always mactive, it is doubtful how far such investigations were valid. These enticisms, however, do not exclude treatment with calcium salts and active parathyroid extracts from use in the disease, but their value is limited to the treatment of those complications which are due directly to the defects in calcium metabolism-that is, the neuro-muscular hyperexcitability terminating in tetany. Here, as in infantile spasmophilia, large doses of calcium carbonate or lactate should be given. When active tetany is present, it can be rapidly relieved by intra-muscular injections of 20 to 30 units of Collip's parathyroid extract every 12 to 24 hours for a day or The value of this treatment has been shown recently by Baumgartner¹⁸, who also proved that a dried commercial extract was mactive. In the cases resembling cœhac disease and sprue, reported by

disease, the primary disturbance appears to be a defective absorption of fat from the intestine¹¹, and, as the production of fat-splitting ferments is normal, the bulk of the excess fat found in the stools in the severer cases is present as free fatty acids12,13. In mild or convalescent cases the diarrhoa ceases, and this is associated with a decrease in the amount of fat in the stools which is now chiefly combined as calcium soaps 13, 14, 15. To convert the fatty acids into soaps, and so limit the offensive diarrhea, Miller¹² recommends that, besides the limitation of fat in the diet, alkalis, including calcium, should Of these lime is probably the best: it is preferable to the alkaline salts of sodium or potassium, since these are readily absorbed from the upper part of the small intestine, and in this condition it is desirable that most of the alkalı given should not be absorbed, but be free to combine with the excess of fatty acid present in the lower bowel Also in the more severe cases, it is likely that a large proportion of the calcium in the diet will remain unabsorbed. This point needs further investigation, but the occasional occurrence of tetany as a complication of the disease suggests that such patients are frequently on the border-line of deficient calcium assimilation Holmes and Starr¹⁶ recently reported cases resembling cœliac disease in adults, in which administration of large doses of calcium salts by the mouth modified the diarrhea, though this treatment did not relieve the accompanying tetany.

Calcium administration, together with treatment by dried parathyroid extract, had a considerable vogue a few years ago in the treatment of sprue. In so far as its intestinal features are concerned, this disease resembles cœhac disease very closely, with the exception that here the metabolic changes are associated with gross anatomical lesions in the gut. The stools

CALCIUM EXCRETION.

Both the urmary and fæcal excretions of calcium vary considerably within the normal limits, but the exact significance of changes recorded in many diseases is not clear. Much has been made of the argument that an increased excretion of calcium in certain diseases constitutes a sound basis for calcium therapy The assumption has been made that the excessive excretion directly or indirectly increases the rapidity of the progress of the disease, or increases the seventy of the symptoms. No sound evidence that this assumption is true is forthcoming in any single instance, and with few exceptions treatment with calcium salts in such conditions has yielded completely negative results Pulmonary tuberculosis is a typical example Following the early work of the French school, which was said to have established an increased excretion of calcium during the disease, wide claims were made for the beneficial effects produced by administering calcium Moreover, such treatment was supposed to have been placed on a surer basis by reports that pulmonary tuberculosis was less frequent in districts where the soil contained much calcium, and among workers in occupations involving continuous contact with lime None of these claims has stood the test of further investigation; the supposed increased excretion of calcium in pulmonary tuberculosis has been repeatedly shown not to occur in carefully controlled experiments; clinical results with calcium treatment in the disease have been disappointing; and recent statistics for this country show that the mortality from pulmonary tuberculosis among workers in lime is similar to that among the population in general Further experimental work on animals does not lend any support to the contention that calcium administration has beneficial effects in controlling the extent or rapidity of the disease 20

Holmes and Star¹⁶ and referred to above, injections of Collip's extract rapidly cured the tetany.

Changes in the reaction of the intestinal contents towards the alkaline side play a considerable part in producing defective calcium absorption in disease Many observers have shown that the administration of acids by the mouth increases the amount of calcium absorbed from the intestine, and it is useful to remember this in cases in which calcium absorption is defective Bergeim¹⁹ obtained the same result from diets containing a high proportion of sugar, this effect being also probably due to increased acidity of the intestinal contents from the formation of lactic acid during fermentation Lactose is the most effective sugar, 25 per cent of this sugar in the diet produced a marked increase in calcium absorption. Whenever there is reason to consider calcium absorption defective, carbohydrate may be a useful addition to the diet. It is an interesting sidelight on the intricate adjustments of the animal economy that carbohydrate should be supplied as lactose in maternal milk

When the reaction of the intestinal contents is more alkaline than normal calcium absorption is defective. This sequence of events probably occurs in active rickets. During healing, under the administration of vitamin D, the reaction of the intestinal contents rapidly returns to normal, calcium and phosphate absorption increases, and the bone lesions improve. Recent observations have consistently shown that the pathological changes in blood chemistry and microscopic anatomy during the disease are due primarily to defective absorption of phosphorus and calcium from the gut Vitamin D corrects this defect by restoring the intestinal reaction to normal: how this is effected and whether it is the whole explanation are questions yet to be decided

the process of coagulation. Later Lee and Vincent²³ showed that blood taken from cases of obstructive jaundice coagulated in the normal time on the addition of a drop or two of a 1 per cent solution of calcium chloride, and that the therapeutic administration of calcium salts in the course of a few days decreased the coagulation time These observations were repeated by them in experimental obstructive jaundice in the dog They administered calcium lactate to patients in doses of 100 grains a day for a week or longer, and when an immediate effect was desired, injected the drug intravenously. The effect of the injections, though striking, is only temporary, and it may be necessary to repeat them for some days. According to Walters24 the high mortality of operations in cases of obstructive jaundice is largely due to post-operative hæmorrhage; and the necropsies of many of the cases show intraabdominal hæmorrhage His routine for icteric patients is to administer three intravenous injections of calcium chloride on successive days, each of 5 c.cm. of a 10 per cent. solution. Recently, it has been shown²⁵ that injections of Collip's parathyroid hormone have a similar effect upon the coagulation time in jaundice. The best results followed the injection of 10 to 15 units every 36 hours for about three doses Zimmermann²⁶, however, does not agree with these conclusions, but the method which he used for determining blood coagulability is open to criticism. Nevertheless calcium is now the routine treatment in these cases

The use of calcium has been suggested in the rare condition of bile peritonitis following perforation in phlegmonous or gangrenous cholecystitis. It was shown²⁷ that the toxicity of bile was due to the bile pigment, and that as calcium combined with this it might afford a protective measure. But calcium chloride does not decrease the toxicity of bile when the two are injected intravenously at the same time²⁸;

CALCIUM AND BLOOD COAGULATION.

One of the most important functions of calcium is the part which it plays in initiating coagulation of the blood, and the administration of calcium salts in various ways has been widely practised in a number of conditions associated with serious hæmorrhage now known, however, that calcium administration has little or no effect in shortening the coagulation time of drawn blood, except for a short period after the calcium is given by intravenous injection, or in abnormal conditions in which the amount of ionized blood calcium is low. A diminished blood calcium does not occur in most of the conditions for which calcium has been given, for example, it is absent in simple hæmorrhage from wounds, gastric or intestinal ulcers, in hæmoptysis, aneurysms, in menorrhagia, hæmophilia and the leukæmias. Oral calcium administration in these conditions has no sound theoretical basis and is useless in practice. The only likelihood of increasing the coagulability of the blood by treatment with calcium is to give repeated injections. Neumann²¹, for instance, claimed very good results in the treatment of pulmonary hæmorrhage by intravenous injections of calcium chloride, but he administered up to 10 c cm. of a 10 per cent solution intravenously from two to five times daily.

In one condition, however, calcium administration as a prophylactic measure against hæmorrhage is definitely useful, namely, as a pre-operative treatment in obstructive jaundice. It is known that in this condition the coagulation time of the blood is much prolonged, and this is associated with a fall in the serum calcium. Further, it is probable that part of the calcium becomes bound in some way to the bile pigments, and it was suggested years ago²² that in this way the calcium was rendered unavailable for

calcium to less than 7 mgms. per cent · a level which may be termed the "tetany threshold." Clinical tetany can be completely controlled by frequently repeated intravenous injections of calcium chloride, or by the oral administration of large doses. Acids or ammonium chloride have the same beneficial effect since administration of these substances produces acidosis and a rise in the serum calcium

In practice, however, the use of calcium alone is inconvenient, except as an emergency measure, when it should be given intravenously Large doses, up to 15 gms daily should be given orally, because of the poor absorption. Nevertheless, this was the main treatment until the introduction of reliable active parathyroid extracts²⁹. Yet in all cases a high calcium intake in the diet should be ensured by liberal quantities of milk with the addition of calcium carbonate or lactate In post-operative tetany, properly graduated injections of Collip's extract ("parathormone") provide a complete substitution therapy, though even here something can be done to reduce the frequency of the injections by regular calcium administration. In infantile tetany, in which rickets is generally the primary condition, feeding with lime cannot be too strongly insisted upon The parathyroid hormone raises the blood calcium by withdrawing supplies from the bones It is therefore obvious that in adopting this treatment for tetany in rickety children, it is essential to provide a proper supply of vitamin D and a high calcium and phosphorus diet If this is neglected, the bone changes will be made worse The use of parathyroid in these cases should be regarded as an emergency measure, to be used only until the rickets has commenced to subside, when the tetany will rapidly disappear

Many chinical reports of the use of Collip's para-

hence the pre-operative use of calcium salts is limited to their effects in shortening the coagulation time, and is not of any value in overcoming the toxic effects of hyperbulirubinæmia or as a treatment for bile peritonitis Except in obstructive jaundice the oral administration of calcium is powerless in arresting hæmorrhage; but parathyroid extract treatment (Collip) may be useful in a wide class of cases 25 Gordon and Cantarow reported a large series of patients with hæmorrhage from various causes in which they found that the subcutaneous injection of 10 to 15 units of parathyroid extract 30 to 36 hours was distinctly valuable. best results were obtained in cases of hæmoptysis, post-partum hæmorrhage, menorrhagia, post-operative hæmorrhage after nasal and tonsillar operations, and, as referred to above, in cases of obstructive jaundice Doubtlessly the advantages of such treatment over calcium administration are due to the certainty and ease with which hypercalcæmia can be produced.

THE TREATMENT OF TETANY.

The most spectacular effects from the administration of calcium are those seen in tetany. It has long been known that calcium in the ionic form is essential for the normal functioning of nervous and muscular tissues. Removal of the parathyroid glands in dogs produces tetany, and the symptoms can be relieved temporarily by the injection of extracts of the parathyroid glands, or by the administration of calcium salts. This experimental tetany is identical clinically, and in regard to its chemical features, with the condition that sometimes occurs in man following removal of the parathyroid glands in operations for goitre, and also with infantile tetany. All these conditions are characterized by a fall in the serum

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CALCIUM AND URAMIC CONVULSIONS

The neuro-muscular hyperexcitability of uræmia has been associated with changes in calcium metabolism. Bennett³² described the chemical and chincal features of a case of bilateral cystic disease of the kidneys which he was able to follow during the last few years of life. This study showed that uncomplicated renal failure causes progressive phosphate retention in the later stages. The morganic phosphate in the blood rose and the calcium fell. When convulsions occurred the serum calcium was below 7 mgms. per cent Pincus, Petersen and Kramer³³ found that there is a marked decrease in both the "free" and total calcium of the serum in infantile and experimental tetany In chronic nephritis, without uræmic convulsions, the free calcium is normal though the total calcium is usually lowered. In one patient with convulsions the "free" calcium was reduced to the level met with in tetany. Though further investigations are required, this suggests that uramic patients do not suffer from convulsions unless the free calcium is much below the normal level of 5 mgm. per cent. In chronic nephritis, some degree of acidosis always follows phosphate retention, and may lead to increase in the ionised blood calcium in proportion to the total calcium, which is reduced All these facts suggest that there is a relationship between the immediate causes of tetany and of the twitchings of uramia The differences between the chnical manifestations of these two are largely differences of location and severity, the essential features are similar. The changes of calcium and phosphorus in uramia suggest that intravenous calcium therapy should provide at least temporary relief during convulsions, though benefit would be palliative, since the

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thyroid extract in infantile tetany have now appeared, and without exception have demonstrated that its administration will relieve permanently all evidences of spasmophilia The doses used and the intervals at which they have been given have varied considerably with the severity of the symptoms and Rivkin³⁰ suggested that about 5 units per kilo. should be administered subcutaneously for each milligram rise in serum calcium that is desired, and that this amount should be given in divided doses at 4 to 6 hour intervals within 24 to 36 hours routine is followed there is little danger of hypercalcæmia, but it is advisable in all cases to control the administration by periodical serum calcium determina-Most writers have used large doses of calcium salts in addition to this treatment and have usually found that the parathyroid extract can be discontinued or the dose much reduced within a few days Smith and Shepardson³¹ reported an interesting case of post-partum tetany in an adult in whom striking benefit followed the administration of the extract. To give some idea of the scale of dosage used for adults they administered 50 units intravenously at the outset, and followed this by 25 units every 6 hours intramuscularly for about 2 days, and later 10 units subcutaneously every 8 hours for a day or two longer Within 12 hours of beginning this treatment all symptoms of tetany had subsided

In all these reports, which are almost exclusively by American writers, active extracts have been used In this country physicians are at a disadvantage, in that commercial preparations are generally mactive. They are mostly manufactured at present in the United States, and though active when tested in that country, have deteriorated by the time they are placed on the market here. It is clear that this difficulty can be obviated by manufacture in this

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guanidine and chloroform. Hypoglycæmia was also present, but treatment with intravenous injections of glucose was not successful, whereas the injection of calcium salts restored the blood sugar to normal They tested the treatment in a few patients with impairment of liver function, and found distinct improvement. In one case of eclampsia, convulsions were promptly relieved and the general clinical condition much improved. The calcium was given as intravenous injections of 10 c cm of a 10 per cent, solution of calcium gluconate. At present the exact value of the treatment cannot be decided, but the results obtained are suggestive, and there is no doubt that it has substantial experimental support.

CALCIUM AND CELL PERMEABILITY.

Calcium has long been recognised to play an important part in controlling the permeability of cell membranes. The pioneer work of Loeb led to a number of experimental and clinical observations directed to determine whether this property was of practical importance in relation to the production and treatment of effusions and ædema. The general conclusion is that calcium salts, when suitably administered, reduce inflammatory exudations in experimental animals, though in patients the results are dis-Subcutaneous injections of calcium appointing chloride duminish or prevent the formation of pleural exudates produced by the intrapleural injection of a solution of copper sulphate³⁷, and similar benefit is produced by injections of Collip's parathyroid hormone³⁸. Failure to obtain satisfactory results with calcium salts in preventing effusions in man might be due to insufficient doses and the difficulty of producing persistent hypercalcæmia

Most of the clinical trials with calcium have proved disappointing, though encouraging results have been

underlying cause would not be affected.

Chronic renal changes with phosphate retention, which is stated to decrease the calcium concentration in the blood, are found in the rare condition of renal dwarfism which occurs in children. It is known that these cases exhibit severe acidosis in the later stages. In spite of well-marked phosphate retention tetany or convulsions are usually absent, and Lathrop³⁴ has shown in one case that "free" calcium of the blood was normal when the total calcium was very low He suggested that in this case acidosis was the determining factor in maintaining the free calcium of the blood at a normal level and so preventing the onset of tetany. Cases of renal dwarfism always show bone changes which are difficult to differentiate from those of true rickets Lathrop, however, considers that they are characteristic merely of delayed ossification and has shown that the product of the blood calcium and phosphorus is over 40—a value which is well above the rachitic level. He considers that the defective ossification depends upon the low calcium concentration in the blood

CALCIUM IN THE TREATMENT OF HEPATIC INSUFFICIENCY

An entirely new field for calcium therapy has recently been suggested by experiments in treating dogs poisoned with carbon tetrachloride by intravenous injections of calcium chloride. Minot³⁵ found that animals which had received a diet deficient in calcium were more susceptible to poisoning by carbon tetrachloride; whilst animals which were fed for a few days on a diet rich in calcium were very resistent to the drug. Poisoned animals, showing gastrointestinal symptoms and tetany-like convulsions, could be cured by intravenous injections of calcium chloride. The same results³⁶, were obtained in poisoning by

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lactate 18 gms daily produced satisfactory diuresis and improvement⁴⁸ ⁴⁹. The same benefit can be obtained from injections of parathyroid extract in cases of true nephritis with cedema, and nephrosis McCann⁵⁰ reported in detail three very interesting cases of renal cedema which, after other treatments had been unsuccessful, yielded to the intramuscular administration of parathyroid extract, the improvement was associated with marked diuresis McCann was cantious with his doses. An initial injection of 10 to 20 units should be given, and this may be repeated in a few days. It may not be necessary to repeat the injections more than two or three times at intervals of a week or so Though no urgent evidences of hypercalcæmia are to be expected from such doses, it is advisable to control their effect by serum-calcium determinations; if this is impossible hypercalcæmia may be suspected if lethargy, irritability, vomiting, and diarrhea ensue about six hours after an injection McCann pointed out that the druresis persists long after the transient rise in serumcalcium induced by the small doses of parathyroid mentioned. He states that no definite divires s follows this treatment in non-ædematous patients. Nevertheless, it is probable that the diuretic action is initiated by the rise in serum calcium whether treatment with parathyroid or calcium is used Moreover, this explains the very large doses of calcium salts required by mouth. because it is difficult thus to raise the blood-calcium in this way.

Intravenous injections of 0.5 gm. of calcium chloride, or alternatively oral administration of 3 gm. calcium lactate daily, cause a temporary diuresis in cases of cardiac ædema^{51, 52}. The best results are obtained when this treatment is given with digitalis Segall and White⁵³ recently reported a group of six patients with cardiac failure and ædema, all of whom

obtained in tuberculous pleurisy after the administration of very large quantities of calcium salts. Navarro³⁹ describes good results in some 80 per cent. of cases, 75 per cent. of the effusion being absorbed in five to ten days He used a simple formula in order to get over the difficulty of the repeated administration. calcium chloride and soluble starch, each 30 grams, lemon jelly 100 gm and distilled water 20 c.cm A teaspoonful of this was taken ten or fifteen times during the day Oriani⁴⁰ gave similar doses at first and later up to 30 gms daily, with beneficial effects. Others have reported similar results41, 42. All these writers have kept their patients on a diet poor in salt, and this robs their deductions of some of their value Nevertheless, it seems clear that calcium when administered in large doses, may be distinctly useful to facilitate the absorption of effusions. This is probably nothing more than a salt action producing diuresis

During the last few years interest in the treatment of œdemas has been centred on those of noninflammatory origin The earlier observations were made on patients suffering from war ædema43,44 It was found that after the administration of big doses of calcium salts marked benefit with diuresis and rapid subsidence of ædema occurred Later such treatment was found to be successful in reducing nephritic œdema45, and similar results have also been found in cardiac ædema, and in the ædema of hepatic currhosis⁴⁶ Blum and his colleagues⁴⁷ consider that calcium chloride is the least harmful and most efficient diuretic in renal disease, and maintain that its administration is the best treatment for nephritis with cedema when given in doses up to 11 gms daily, together with a salt-poor diet. Other writers have reported cases of cedema associated with diabetes or renal insufficiency in which calcium chloride or

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shown to occur in the intact animal Patients with tetany in which the serum calcium may be lower than in these skin diseases do not show irritability of the sympathetic nervous system, nor do they suffer from acro-asphyxia or chilblains

Urticaria is another condition in which calcium administration has been widely practised. Almroth Wright⁵⁶ was the first to advocate its use on the grounds that in sufferers the coagulation time of the blood is diminished, and that possibly urticaria is due to a diminution of the blood-calcium Later a definite type of urticaria associated with a fall in blood calcium was described^{57, 58}. White⁵⁹ reported twenty-three cases of urticaria treated with calcium lactate: only half of them showed satisfactory improvement, and many writers have since described a normal blood calcium in cases of urticaria^{60, 61, 62, 63}. Burgess⁵⁵ has shown that when dermographism is the predominant symptom, the "precipitable" calcium of the bloodserum is low, and such cases respond rapidly to treatment with calcium salts, when dermographism is not marked, the fall in blood-calcium is less noticeable, and treatment with calcium salts produces no striking benefit. It may now be accepted that calcium is not of general value in urticaria, but cases occur in which it is exceedingly useful. Nevertheless calcium salts, as usually given, do not increase the coagulability of the blood and defective coagulation has no immediate relation to the occurrence of the wheals Deficiency of blood-calcium means not only a tendency to diminished blood coagulability but increased capillary permeability, a condition leading to cedema The question then remains whether it would be possible to diminish capillary permeability in all cases by giving calcium in excess Intravenous injection with very large doses is the only likely way to do this.

Calcium has also been employed in a number of

had failed to respond to treatment by rest in bed, digitalis, and various diuretics. During administration of calcium chloride, by mouth, or in some cases intravenously, well-marked diuresis occurred, sometimes not beginning for a few days and continuing until a few days after the drug had been discontinued. These writers found no evidence of any direct effect upon the circulatory mechanism. They concluded that the diuretic effect of calcium chloride is due to its influence upon water exchanges in the tissues rather than a direct cardiac action. Lowenberg⁵⁴ had previously come to a similar conclusion from the fact that the dose required to produce a diuretic action was different from that required to affect the heart.

It is clear that the occurrence of calcium divides is independent of the cause of the ædema. Calcium has no such dividence action on normal men or animals. The evidence suggests that the primary and important factor concerned is changes in the ionic balances of the tissue fluids.

CALCIUM IN SKIN DISEASES

Calcium administration is advocated for certain diseases of the skin. The commonest of these are acro-asphyxia and erythema permio. It has been shown⁵⁵ that these diseases readily fall into two groups in the one group the serum calcium is normal, in the other it is greatly diminished. It is the latter group that benefit from calcium and parathyroid treatment. We are still in the dark, however, as to the relation of the disease to the serum calcium. It may be that in some of these diseases the low serum calcium is due to an endocrine deficiency, and that it leads to increased irritability of the sympathetic nervous system. Such an irritability can be produced in isolated tissues by limiting the calcium, but it has not been

CALCIUM METABOLISM

shown that calcium and parathyroid administration has no beneficial effects. Out of 235 cases of varicose ulceration in which such treatment was given only 94. or 40 per cent., healed; out of 857 cases in which this treatment was not given, 562, or 65 per cent, healed. Both groups, of course, received suitable local treatment.

In conclusion, it is evident that calcium deficiency in clinical medicine is most often secondary to established disease: in such cases calcium treatment may correct the deficiency and, where this has been responsible for symptoms, lead to their alleviation, but in none of these patients does this treatment have any action upon the underlying cause of the trouble.

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conditions closely allied to urticana. It has been recommended for hay fever⁶⁴ and the coryza of iodism.⁶⁵ Kayser⁶⁶ first recommended calcium therapy in asthma, and since then many enthusiastic reports as to its value in this condition have appeared. Without exception, however, they fail to carry conviction, most of the observations have been made without any controls, and in view of the great difficulty in assessing fairly the value of treatment in this condition, the opinions expressed have no specific value.

CALCIUM AND ULCERATION.

Some years ago, the treatment of chronic ulceration with calcium and dried parathyroid extracts achieved considerable prominence, particularly for varicose ulceration⁶⁷ Grove and Vines⁶⁸ showed that what they called the "ionic" calcium of the serum, as estimated by Vines' method, was lowered in such conditions and returned to normal followed by improvement in the lesions when calcium salts were given by the mouth or as intramuscular injections, along with dried parathyroid extracts These writers suggested that the deficiency in "ionic" calcium in the blood was due to toxic agents affecting the parathyroid glands, and also combining in some way with that part of the calcium in the blood which is normally There have been many criticisms of this work. To establish this as a basis for such treatment, it must be proved that the fall in blood calcium has a causal relation to the ulceration, and this has not been shown to be the case Vines' method for estimating "ionic" calcium was a biological one, and it has been difficult to decide what his "ionic" calcium corresponds with in strict chemical methods of analysis. Moreover, the clinical optimism aroused has not been justified by ultimate results In a collective investigation the British Medical Association 69 have recently

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- (8) Endocrine disorders.
- (9) Local —(a) obliteration of the uterine cavity, e g sloughing, (b) uterine atrophy, (c) bilateral solid ovarian tumours, (d) surgical removal of uterus and ovaries

The main object of this article is to point out that almost every one of the conditions mentioned in this table is accompanied by some degree of acidosis, defining this as a decrease of the plasma bicarbonate. This definition does not necessarily imply any alteration in the reaction (pH) of the blood to the acid side of normal. We have not measured the pH in the cases under consideration.

ACIDOSIS IN PHYSIOLOGICAL CONDITIONS

It has been shown elsewhere² that in healthy women of the child-bearing age, the plasma bicarbonate is slightly lower than in normal men of the same age. Also, that in normal women at the menstrual periods, the plasma bicarbonate is again slightly lower than in the intermenstrual intervals ³. In children, up to the age of puberty, the bicarbonate is on the average, the same as in normal intermenstrual women, and this applies to children of both sexes, but with the earliest signs of "unfitness," not amounting to ill-health, there is a distinct tendency for the bicarbonate to fall below normal, a degree of instability of the bicarbonate not so commonly found in adults

The following table shows the average bicarbonate values obtained in the several groups of persons studied. In all cases, the plasma bicarbonate was estimated by the method of Van Slyke, Stillman and Cullen⁴ with the usual precautions, and with the slight modifications of the method described elsewhere ⁵ The results are expressed as molar

A Note on Acidosis in Relation to Amenorrhæa.

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AND

H. G CLOSE, MB, BS Clinical Assistant to the Hospital

MENORRHŒA, not associated with gross local pelvic abnormality, occurs either as a physiological or as a pathological phenomenon, Physiologically, (1) before puberty, (2) during pregnancy, and (3) after the menopause The following table of the pathological conditions in which amenorrhæa is a frequent symptom is taken from Eden and Lockyer's "Gynæcology"

TABLE I.

Causes of Amenorrhæa.

- (1) General debility from —(a) Acute illness, (b) convalescence after illness or operation, (c) late stages of chronic disease, chronic nephritis, diabetes, tuberculosis, malaria and carcinoma
 - (2) Severe anæmia
- (3) Chronic poisoning—alcohol, lead, morphia and drugs
- (4) Disorders of the nervous system—shock, overwork, hysteria, and insanity
 - (5) Change of climate, imprisonment, etc
 - (6) Obesity of rapid onset
 - (7) Chill

A prehminary Report to the Medical Research Council From the Department for Medical Investigations, Queen Mary's Hospital, London, E

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was the acidoms present, of a type different from that described here. It has been shown classified that in "debility," both in adults and in cl. 12; ;... some degree of acidosis is generally for vi In view of the frequency with which debilit; .. amongst patients of the so-called hospital circ this fact must be taken into account when - 1 -, the observations recorded are thush derick from subjects belonging to this particular can i class It would seem from the above that, in 1 -3, the physiological and pathological conditions in \$1.50% amenorrhoea occurs, a lon plasma becothered frequently found, and this suggests that then the be some relationship between the two lor the reason, estimation of the plasme breathons's 50. carried out in a number of cases of primary and secondary amenorrhoa, not associated with cropelvic abnormality, nor with obvious general dies.

THE PLASMA BICARBONATE IN AMENOPRHET!

During the routine investigation of a large wife of cases of normal pregnancy, carried out at Quirn Mary's Hospital, we encountered 31 instances of secondary amenorrhoea in women who had attended m order to ascertain whether or not they mucht have become pregnant. The only symptom precent le of m these cases was the missing of the last two or three tion ' menstrual periods. None of them showed obvious agns of definite organic disease, none of them had recently suffered from any acute illness, and all of them belonged to the hospital social class. It was

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TABLE II.

Group	No of Cases	Plasma, Bicarbonate	
		Average	Range
Normal adult males menstrual) ,, ,, (menstrual) ,, pregnancy Normal children	86	0 032	0 034 -0 0298
	31	0 0301	0 0317-0 0280
	31	0 0291	0 0321-0 0260
	240	0 0247	0 0300-0 021
	45	0 0299	0 032 -0 0265
Debilitated adult females Secondary amenorrhœa	72	0. 0271	0 032 -0 0205
	45	0 0285	0 0325-0 0230

Summarizing the above, it may be said that, in general, the plasma bicarbonate is comparatively unstable in children before puberty, and gradually becomes less subject to fluctuation as this period is approached. It tends to be slightly lower in adult women than in adult men, and is definitely decreased during menstruation.

ACIDOSIS IN PATHOLOGICAL CONDITIONS

Considering now the pathological conditions in which amenorrhoea is apt to occur, it may be said at once, that with the exception of Sections 5 and 9 of table I, a decrease of the plasma bicarbonate is found as a general rule in most of the disorders enumerated, and often in all It is not possible for considerations of space, to give figures here on this point in all the conditions named Some of these have already been published, and others are incorporated in papers now in course of preparation. In one condition only of those mentioned, namely, in early pulmonary tuberculosis,

ACIDOSIS IN AMENORRHŒA

was the acidosis present, of a type different from that described here It has been shown elsewhere⁶ that in "debility," both in adults and in children, some degree of acidosis is generally present view of the frequency with which debility occurs amongst patients of the so-called hospital classes, this fact must be taken into account when, as here. observations recorded are chiefly derived from subjects belonging to this particular social class It would seem from the above that, in both the physiological and pathological conditions in which amenorrhœa occurs, a low plasma bicarbonate is frequently found, and this suggests that there may be some relationship between the two For this reason, estimation of the plasma bicarbonate was carried out in a number of cases of primary and secondary amenorrhoea, not associated with gross pelvic abnormality, nor with obvious general disease

THE PLASMA BICARBONATE IN AMENORRHEA.

During the routine investigation of a large series of cases of normal pregnancy, carried out at Queen Mary's Hospital, we encountered 31 instances of secondary amenorihæa in women who had attended in order to ascertain whether or not they might have become pregnant. The only symptom present in these cases was the missing of the last two or three menstrual periods. None of them showed obvious signs of definite organic disease, none of them had recently suffered from any acute illness, and all of them belonged to the hospital social class. It was subsequently ascertained that none of these patients was pregnant.

The average plasma bicarbonate for this group was 0 0285 M, the normal for a perfectly fit woman being 0 0300 M (inter-menstrual) Acidosis then, is

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commonly found in women suffering from amenorrhœa As it had previously been noticed that the amenorrhœa occurring in cases of chronic nephritis treated with alkalis frequently cleared up, it was decided to try the effect of giving sufficient alkali by mouth to raise the plasma bicarbonate to a normal value in cases of uncomplicated amenorrhœa It was found that by this procedure alone, normal menstrual function was restored in a sufficient number of cases to suggest that the relationship between amenorrhoea and acidosis was of considerable importance The following cases illustrate the chief relevant points :-

CASES

Case 1 Secondary amenorrhæa —Miss B, æt 24, a wartress No periods at all for the past thirteen months. Menstruction began at 15, but was always irregular, and generally with excessive loss She was pale, with a greasy, spotty complexion, and the face looked slightly puffy She occasionally complained of pain in the abdomen, but was not habitually constipated During the past year she had been putting on weight. There was a tendency to excessive sweating. She was phlegmatic, and preferred warm weather. Blood pressure = 120/80 mm Hg NaHCO₃ before treatment = 0 0270 M. Alkaline powder, consisting of sod bic and pot cit grains xxv of each, in 1½ oz of water, was given by mouth, three times a day, or 150 grains a day After 21 days she complained of pains in the abdomen, and menstruation commenced and lasted one day The same dose of alkalı was continued and for the two following months menstruation was normal, after which she ceased to attend hospital

Case 2 Secondary amenorrhosa—Miss E D, æt 18 No periods for six months. A perfectly healthy girl in every other respect. Good colour and complexion. Subject to slight swelling of the ankles after standing, but has various veins. Seen 6 10 27 plasma NaHCO² = 0 0291 M. Given alkaline powder as in previous case, 180 grains a day. A month later had a period lasting a few hours. Dose continued and the following month had a normal later form down. Plasme NaHCO = 0 0302 M. Given period lasting four days Plasma NaHCO₃ = 0 0302 M. Ceased to take alkalis Periods continued regularly until Oct 1928 when they ceased altogether 180 grams of alkali resumed in Feb 1929 followed by two normal periods. Alkalis taken continuously since then, with normal periods.

ACIDOSIS IN AMENORRHŒA

Case 3 Primary amenorrhea - Miss D, æt 28, a typist. Always perfectly healthy Plays tenns and dances Good colour. healthy appearance Chief symptom is swelling of face, hands, feet and legs, especially marked once a month for 3 to 4 days. but always some swelling present, except in very cold weather Remembers having some swelling when she was at school before the usual time of puberty The swelling is generally worse at night and after exercise First seen 16 11.28, two days after subsidence of a period of increased swelling. The weather was cold and no swelling could be detected NaHCO3 = 0 0300 M. Plasma Cl = 0.605 g per 100 ocs urine chloride = 0.4959 per cent again on second day of attack of swelling 19 12.28 There was distinct swelling of backs of hands with pitting on pressure, and also of feet and legs half way up the shms She felt perfectly well, and looked so $NaHCO^3 = 0$ 0283 M. Plasma Cl = 0 614 g per cent Urme C1 = 0 099 g per cent Alkalis in doses of 180 grams a day were given. About a month later she had a usual attack of swelling, without any menstrual flow The same dose was continued and she was told to increase this to four times a day, 1 e 240 grains a day, for 3 or 4 days before the next expected attack of swelling As a result a month later she had, for the first time, a normal menstrual period and no swelling at all

Case 4 Secondary amenorrhoa -Miss S, at 25 Except for the symptoms described, a perfectly healthy looking girl with good colour and complexion Fond of tennis and denoing Appendirectomy at 16, otherwise no previous illnesses Had only three periods during the past two years, the last nine months ago. Had had three attacks of cedema of the face, arms, and legs, associated with what she described as "swelling of the abdomen" Each attack lasted three days to a month, but were apparently not definitely related to her expected menstrual epochs. The swelling was made worse by dancing and walking. She had no pain at these times, and did not feel unwell. She was not subject to headaches She was inclined to be nervous and excitable First seen 9425 She had apparently just recovered from the third attack of generalized cedema. There was no cedema to be seen, but the abdomen seemed to be rather full in the lower half No evidence of ascites could be obtained. The blood pressure was 150/100 mm. Hg, but she was evidently nervous Plasma NaHCO: = 0 0326 M. Urme very acid She was given 200 grains of alkalı a day, despite the high plasma bicarbonate, on the purely hypothetical assumption that possibly the tissues might be "acid." After three days the urme was still acid (pH = 5 0) On the fourth day she complained of feeling unwell with headache and nausea It was then found that the urme had suddenly become strongly alkaline (pH = 8 4) Later in the day she began to menstruate Unfortunately a further blood examination was not made at this tume The dose of alkalı was reduced to half, and 14 days later she had a second normal menstrual flow lasting three days, though the urne had by then again become very acid (pH = 4.7) She continued to take alkalis 100 grains a day for the next few weeks.

and then left the country On inquiry eighteen months later it was learned that she had since had normal and regular menses, and she had continued to take alkalies, in an irregular fashion and in uncertain doses. It would seem that in this case the first blood examination was probably made just after what should have been a normal period, and hence the high figure, but there is no direct evidence of this

In both of the following cases treatment with alkalies failed to influence the condition

- Case 5 Primary Amenorrhoea—Miss P, æt 25 Small build, pale, looks unfit but says she feels well, except for some swelling of the legs which she has noticed for "some time" Examined by gynœcologist who reported nothing definitely abnormal, but "could not exclude possibility of infantile uterus" First seen 20 10 26, NaHCO₃ = 0 0274 M Given alkalies as in previous cases without result Dose increased to 600 grains a day by 31 3.27, NaHCO₃ = 0 030 M, but no result Later, dose was increased to 1,000 grains a day Urine became very alkaline and excess must have been passed in urine as NaHCO₃ of plasma fell to 0 0264 M. Treatment was then abandoned Subsequent history unknown
- Case 6 Secondary Amenorrhea —Mrs T, æt 30 No periods for "some months" Pale, but did not look definitely unfit Seen 23 12 26, NaHCO $_3$ = 0 0298 M Given alkalies in increasing doses up to 400 grains a day for the next four months but without result. Later she was given pituitary (extract of whole gland) by mouth together with small doses of alkalies, and had a normal menstrual period. She ceased to attend hospital and her subsequent history is unknown. This is the only case in this series in which treatment in any form other than the alkalies was employed.
- Case 7 Secondary Amenorrhea —Miss A E, at 18 Last period 4 months ago Menstruation began at 13 Thin, pale, but does not look ill No other illnesses and feels well No monthly symptoms of any kind Plasma NaHCO₃ = 0 0275 M Given alkalies up to 240 grains a day Periods recommenced three weeks later, and have continued with the aid of the same dose for the past nine months
- Case 8 Primary Amenorthea—Miss E M, æt 18 A machinist No other symptoms Well built and looks the picture of health Plasma NaHCO₃ = 0 0305 M Alkalies up to 400 grains a day were given but periods did not return after two months' treatment Subsequent history not known
- Case 9 Secondary Amenorrhea —Mrs W L, æt 22 —No periods for past ten months Has headaches and pain in the right side of the abdomen every month, but no menstrual loss Has been under treatment with thyroid but without result Good build, rather stout Good colour, but skin tends to be greasy

ACIDOSIS ÎN AMENORRHŒA

Plasma $NaHCO_3 = 0$ 0298 M Given alkalies up to grains 240 a day, and periods recommenced 11 days later. She then ceased to attend and her subsequent history is not known.

DISCUSSION

It will be observed that in those cases treated successfully, the plasma bicarbonate was already practically normal (except in Case 1) before treatment commenced. This was probably due to chance selection, as in Case 6, the initial bicarbonate was also normal and yet treatment failed. It will be seen from Table II that the acidosis associated with amenorrhoea is in the nature of a general shift of the bicarbonate to the acid side in the group as a whole, and that there are many individual exceptions In this connection it must be borne in mind that the bicarbonate content of the tissues is not necessarily the same as that found in the blood at any given moment, and that a similar discrepancy may also apply to the reaction of both A condition of "tissue acidosis" may well have been present in any of the above cases with a normal bicarbonate, indeed, the results of giving alkalies to some of these cases suggests that such was the case, though there is no actual proof of this.

It will be noticed that in several of the above cases, notably in numbers 3, 4, and 5, there was, in addition to the amenorrhea, varying degrees of cedema. A slight degree of cedema of the feet and ankles, getting worse towards evening, is a common symptom in women of all classes, but more especially amongst the large group of subnormal women suffering from "debility," who comprise the bulk of the cases seen at the out-patient department of any general hospital. It has been shown elsewhere (5), that taking the groups of individuals enumerated in Table II above, the frequency with which this type of cedema is met with,

and then left the country On inquiry eighteen months later it was learned that she had since had normal and regular menses, and she had continued to take alkalies, in an irregular fashion and in uncertain doses. It would seem that in this case the first blood examination was probably made just after what should have been a normal period, and hence the high figure, but there is no direct evidence of this.

In both of the following cases treatment with alkalies failed to influence the condition

- Case 5 Primary Amenorrhoea—Miss P, at 25 Small build, pale, looks unfit but says she feels well, except for some swelling of the legs which she has noticed for "some time" Examined by gynecologist who reported nothing definitely abnormal, but "could not exclude possibility of infantile uterus" First seen 20 10 26, NaHCO₃ = 0 0274 M Given alkalies as in previous cases without result Dose increased to 600 grains a day by 31 3 27, NaHCO₃ = 0 030 M, but no result Later, dose was increased to 1,000 grains a day Urine became very alkaline and excess must have been passed in urine as NaHCO₃ of plasms fell to 0 0264 M. Treatment was then abandoned Subsequent history unknown
- Case 6 Secondary Amenorrhea —Mrs T, at 30 No periods for "some months" Pale, but did not look definitely unfit Seen 23 12 26, NaHCO $_3$ = 0 0298 M Given alkalies in increasing doses up to 400 grains a day for the next four months but without result. Later she was given pituitary (extract of whole gland) by mouth together with small doses of alkalies, and had a normal menstrual period. She ceased to attend hospital and her subsequent history is unknown. This is the only case in this series in which treatment in any form other than the alkalies was employed.
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ACIDOSIS IN AMENORRHŒA

Charge of the Obstetrical Department at Queen Mary's Hospital for sending us most of the cases for investigation, and for help in many other ways; also to Messrs F Cook and G. F. Gibberd of Guy's Hospital We are also indebted to Prof R Donaldson and Dr Arthur Davies, Directors of the Pathological Departments of Guy's Hospital and of Queen Mary's Hospital respectively, for laboratory facilities

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³ Close, H. G. and Osman, A. A., Broch Journ, 1928, xxi, 1544-7
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is in inverse relationship to the plasma bicarbonate In other words, in those groups with the lowest bicarbonate, namely, in pregnancy and debilitated women, this type of cedema is extremely common, whereas in normal adult men, it is extremely rare Similarly it is more common amongst normal women during the menstrual periods than in the intermenstrual intervals

Now, it has been shown that menstruation is associated with a decreased plasma bicarbonate, and also that normal menstruation can sometimes be restored by giving suitable doses of alkalies in cases of amenorrhœa. Further, it has been shown (4) that in cases of nephritis with œdema, the latter can almost always be made to disappear with adequate doses of alkalies. These facts suggest that both generalized œdema, even of degree so mild as to require the influence of gravity to make it apparent (as puffiness or swelling of the ankles and feet), and amenorrhœa, are both symptoms commonly associated with, if not caused by, an underlying acidosis, a condition which is apt, as described elsewhere (5) to be accompanied by some general waterlogging of the body.

It would seem possible that the hormones concerned in menstrual function may have their action modified by the conditions under which they have to work; that, in fact, they are unable to perform their functions adequately in the presence of an acidosis of the type described, because this leads to undue waterlogging of the body as a whole or of the specific organs concerned; and that alkalies are of value in some cases in promoting diuresis and ridding the body, or these organs, of excess water.

We should like to take this opportunity of recording our indebtedness to Mr L C Rivett, Physician in

which soften or weaken the neck of the femur, such as osteitis fibrosa, or from malumon of a fracture of the femoral neck. The term, however, is not usually used in these conditions, but is applied only when the deformity exists singly without associated disease.

The four types of true coxa vara in order of frequency are -(1) Adolescent, (2) Infantile, (3) Rachitic, (4) Congenital coxa vara Any of these may occur unilaterally or bilaterally. The symptoms, pathological anatomy and treatment differ with each of the four types, which must therefore be considered separately Anatomically, the essential feature of all is depression of the neck of the femur on the shaft; but the site of depression varies, being at the junction of the head and neck in the first variety, at the middle of the neck in the second, at the junction of the neck and shaft in the third and fourth, or, in the third variety, the whole length of the neck may be bent in common with the shaft The clinical features common to all types are a limp, real shortening of the limb with elevation of the greater trochanter, and limitation of abduction at the hip joint These features are due directly to depression of the neck and consequent impingement of the tip of the trochanter against the pelvis

ADOLESCENT COXA VARA

This type is more common in boys than in girls, and is usually unilateral. It is known also as "traumatic" coxa vara, because a history of injury preceding the onset of symptoms is frequently obtainable, and as "slipped epiphysis," which describes the underlying lesion. Sometimes there is no history of injury, or merely one of an apparently trivial injury. Accordingly four clinical varieties are recognized (Elmshe)¹—

(1) The deformity follows immediately upon an

Coxa Vara.

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HE deformity indicated by the term "coxa vara" is characterized by diminution of the angle between the neck and shaft of the femur Normally the neck of the femur is directed upwards and inwards from the shaft at an angle (called the

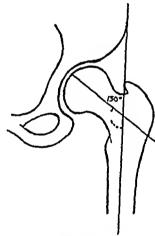


Fig 1 —Diagram of normal hip showing angle of inclination of the neck of the femur

"angle of inclination") of about 130°—slightly more in a child and slightly less in an adult—and also forwards (the "angle of declination") at an average angle of 12°.

Coxa vara is not in itself a pathological condition, but a deformity which may result from any of a number of affections of the neck of the femur. A diminution of the normal angle may and often does occur from destructive or deforming disease of the head of the femur, for example, tuberculosis, acute septic inflammation, or osteo-arthritis, from conditions

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of the head thus comes to project beyond the acetabulum and overlap the under surface of the neck. The upper corner of the stump of the neck is at first prominent opposite the upper border of the acetabulum, but later is absorbed, the upper aspect of the neck then forms a smooth convex surface running into the head. Union occurs simultaneously with slipping. In the final state the head is firmly united to the neck in the displaced position with its lower part projecting below and behind the stump of the neck like a mush-room. The capsule and muscles undergo changes of shortening and lengthening adaptive to the bony deformity. These changes constitute an important factor in maintaining the deformity. Complete separation of the capital epiphysis is rare, but may be the lesion in some cases of acute onset

A case of adolescent coxa vara may, when first seen, be in one of two apparently different states. In almost all cases there is a period while the deformity is progressing when the symptoms are those of an acute intra-articular lesion of the hip. This period may be at the onset or later and may last several or many months The joint is held immobile by muscular spasm, and pain in the hip radiating to the knee, wasting of the thigh and buttock and fullness in Scarpa's triangle may all be present. The clinical picture may thus closely resemble tuberculous disease. In the other state, when the acute symptoms have disappeared, the deformity alone remains The patient walks with a pronounced limp and the limb is shortened, and everted and adducted at the hip joint Owing to the adduction the amount of apparent shortening may be as much as three inches, the true shortening is usually not more than an inch greater trochanter is raised to a degree corresponding to the true shortening and is abnormally prominent Abduction, inversion and flexion are limited mechani-

accident.

- (2) It develops gradually some months after a trivial accident accompanied by slight or no symptoms.
 - (3) There is no history of accident
- (4) After a period of pain, stiffness and possibly even of deformity of the hip, an accident occurs and causes accentuation of the symptoms and deformity.

The part of injury in inducing deformity is either to cause total or partial separation of the capital epiphysis, or to strain the juxta-epiphyseal region of the neck so that subsequent weight-bearing or similar injuries may cause gradual slipping of the epiphysis. It is important to note that the injury may be only slight, so trivial, indeed, as to be overlooked or soon forgotten.

Probably, factors other than injury are concerned in causing slipping of the epiphysis. Without this assumption it is difficult to account for the occasional cases in which no history of an accident is obtainable, or for the bilateral cases Imperfect ossification associated with ill-health or with rapid growth during adolescence, thinning of the epiphyseal cartilage in preparation for the final union of the epiphysis and diaphysis, the normal obliquity of the plane of the epiphyseal line and pre-existing rachitic coxa vara making the epiphyseal line more vertical, are conditions of the femoral neck which may predispose to slipping of the epiphysis Rapid increase of bodyweight in adolescence or from endocrine disturbance (which is often observable in the subjects of this type of coxa vara) is also probably an influence to be con-There is no evidence of rickets or mild inflammation weakening the epiphyseal line and thus predisposing to slipping of the epiphysis

The pathological anatomy of the condition is as follows. The head of the femur slips downwards and backwards on the neck, separation taking place in the juxta-epiphyseal region of the neck. The lower part

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similar except that the projecting upper corner of the neck has usually been absorbed, the upper border appearing smooth and rounded and convex upwards At an earlier stage the appearances are not so obvious In the earliest state—that of juxta-epiphyseal strain there is nothing abnormal to be seen in a skiagram. The first signs that the epiphysis is beginning to slip are (1) The lower margin of the epiphysis encroaches slightly upon the normally continuous curved line formed by the lower margins of the neck and the ramus of the pubes, (2) the upper margins of the head and neck form an unbroken line in the same plane, (3) the eqiphysis appears slightly compressed To observe these signs accurately the skiagram should be taken with the limb a little inverted The epiphyseal line appears ragged, fluffy and abnormally long The apparent compression of the epiphysis is due to the backward displacement

In the acute phase adolescent coxa vara has to be distinguished from tuberculous arthritis. In tuberculosis, real shortening is a late sign and is combined with flexion and inversion of the hip due to destruction or posterior dislocation of the femoral head. In coxa vara, real shortening is present from the first and is associated with extension and eversion of the hip due to the downward and backward displacement of the head. The X-ray appearances are conclusive. When the acute symptoms have subsided the diagnosis has to be made only from other forms of coxa vara.

In considering treatment, a word must be said about prevention. After an accident to the hip in a young person, if an X-ray shows signs of an injury to the neck of the femur, the hip should be fully abducted and maintained thus in plaster of Paris for three months. Subsequently, relief of weight-bearing through the hip joint should be effected by means of a walking

cally by the altered shape of the femoral neck, but the other movements of the hip are unchanged

The radiographic appearances are characteristic. In an acute case of complete separation or marked slipping of the epiphysis, definite downward and backward displacement of the head is evident; the upper corner of the stump of the neck is seen projecting opposite the upper border of the acetabulum



Fig 2—Diagram of skingraphic appearance of a recent case of adolescent coxa vara. Note (a) displacement of the capital epiphysis below the curved line of the lower margins of the femoral neck and the ramus of the pubes, (b) apparent compression of the epiphysis, (c) prominent upper corner of the stump of the neck, (d) upward displacement of the greater trochanter

and the lower part of the head below the lower margin of the neck At a late stage of a case in which slipping has occurred gradually the X-ray appearances are



Fig. 3—Diagram of skiagraphic appearance of a late case of adolescent coxa vara. The epiphysis is fused in its downwardly and backwardly displaced position to the neck, the upper corner of which has become rounded off

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successful.

INFANTILE COXA VARA

This variety is less common than the adolescent and occurs at an earlier age. The exact time of onset is not known, but cases are usually brought for treatment because of a limp noticed on the child first commencing to walk. In some, symptoms are not observed by the parents till about the age of eight, when growth normally becomes more rapid. Girls are as often affected as boys and bilateral cases are common—about one case in four. A history of injury is not usually obtainable.

The symptoms begin insidiously with a gradually increasing limp. In bilateral cases a waddling gait becomes evident, associated with lordosis—a picture closely simulating that of congenital dislocation of the hip. An acute stage does not occur in this form of coxa vara. The hip is abducted, flexed to as much as 40°, and is usually everted, but may be inverted. The adduction and flexion cause considerable apparent shortening, the real shortening is up to an inch or more. The trochanter is correspondingly raised and is prominent. The deformity progresses with age and causes great disability. Pain in the hip is often felt.



Fig. 4.—Diagram of skiagraphic appearance of infantile coxa vara Note (a) clear area due to fibrous intersection in the middle of the neck of the femur, (b) approximation of the head and shaft of the femur

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caliper for twelve months. If no injury to the neck is shown in the skiagram it is still wise to relieve weight-bearing in the same manner for several months, until further skiagrams prove that no slipping of the epiphysis has occurred

In cases seen within the first few months after the onset of symptoms, an attempt may be made to replace the head by forcibly abducting and inverting the limb under an anæsthetic, followed by maintenance in full abduction and inversion in plaster of Paris for three months Forcible abduction is not without danger; complete separation of the head with subsequent absorption, or stiffness of the joint, may result For this reason more gradual replacement of the head is advisable. The hip should be slowly abducted by means of weight-traction, to counterbalance, it is necessary to abduct also the other hip and both limbs should be extended and supported by Thomas knee splints After three months, massage and movements should be commenced and walking allowed with the wearing caliper, which may be adjusted to correct eversion if necessary The caliper should be worn for twelve months

The treatment of late cases is usually operative, the question of operation depending on the degree of limitation of abduction and internal rotation If this is slight, the range may be increased by stretching the contracted soft tissues by manipulation under an With more severe degrees of limitation, anæsthetic trans- or sub-trochanteric osteotomy is necessary. Both abduction and eversion deformity can be corrected by this means The corrected position must be maintained by a plaster-of-Paris spica extending from the axilla to the toes Attempts to replace the head by opening the joint and fixing the head by a bone or metal peg, or to increase the mobility of the joint by removal of bony spurs, are seldom

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taken for confirmation.

Treatment is a difficult problem, particularly in bilateral cases. Anatomical cure is merely a possibility, but an attempt to obtain it is the best method of treatment in cases seen early in life—up to ten years of age. Full abduction of the hip should be obtained by stretching, division of the adductors and subtrochanteric osteotomy, and a plaster-of-Paris hip spica applied. Walking may be allowed after the bone has united at the site of osteotomy. The line of pressure on standing is thus brought directly through the fibrous intersection in the neck, bony union and the development of a strong neck may follow. Even if bony union does not occur, the imposed abduction compensates for the shortening and improves the stability of the joint.

In older children and adults this method is not so effective and some more radical operation must be done. The simplest measure is to remove the head of the femur and fix the hip by plaster of Paris in abduction while walking is permitted for a sufficiently long time—six to twelve months—for a strong false joint to form. Removal of the head, which tends to tether the neck of the femur, considerably increases the range of abduction. The limb remains short and a high boot must be worn.

A more severe operation, but one which gives a more stable joint and at the same time abducts the limb, is on the lines of the "bifurcation" operation of Lorenz. The joint is opened and the head removed Subtrochanteric osteotomy is then done and the limb fully abducted, thereby displacing the site of osteotomy inwards to he against the acetabulum. The subsequent treatment is as for simple osteotomy.

The "reconstruction" operation of Whitman is the best procedure in severe and adult cases. The joint is exposed by an anterior or posterior incision; the

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after exercise and stiffness after resting

The radiographic appearances are characteristic. The neck of the femur is markedly depressed in its whole length, so that the head lying in the acetabulum is separated by only a narrow interval from the shaft. In the middle of the neck is a clear area which separates the head and adjacent part of the neck from the root of the neck. The clear area seen in the skiagram represents a mass of fibrous tissue whole thickness of the middle of the neck may be composed of fibrous tissue, or merely the upper part, the lower border then constituting a bony bridge connecting the head with the root of the neck extreme cases complete solution of continuity sometimes seen, the head lying loose in the acetabulum The greater trochanter is displaced upwards and changes adaptive to the deformity are present in the soft tissues.

The cause of infantile coxa vara is undecided. In the opinion of most, the condition is the result of a partial fracture of the femoral neck sustained at birth or in early childhood, the union is fibrous, because up till the age of four years the upper half of the neck is cartilaginous. When the mechanical factor of bodyweight transmission through the head of the femur comes into play, depression of the weakened neck follows and symptoms appear. It is difficult to explain the frequent bilateral cases thus. It seems clear that rickets is not a direct cause; but it may predispose, softening and weakening the neck by defective ossification.

Difficulty may be met with in distinguishing infantile coxa vara, particularly when bilateral, from congenital dislocation of the hip. The distinguishing sign is the position on palpation of the femoral head—in the acetabulum in coxa vara, on the dorsum ihi in congenital dislocation. A skiagram should always be

COXA VARA

taken for confirmation

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A more severe operation, but one which gives a more stable joint and at the same time abducts the limb, is on the lines of the "bifurcation" operation of Lorenz. The joint is opened and the head removed Subtrochanteric osteotomy is then done and the limb fully abducted, thereby displacing the site of osteotomy inwards to lie against the acetabulum. The subsequent treatment is as for simple osteotomy.

The "reconstruction" operation of Whitman is the best procedure in severe and adult cases. The joint is exposed by an anterior or posterior incision; the

greater trochanter is detached from the shaft and with the muscles inserted into it turned up; the head of the femur is removed, the stump of the neck is then implanted into the acetabulum; the limb being fully abducted, the trochanter is re-attached to the shaft at as low a level as possible. A plaster-of-Paris spica, or weight-extension with the aid of a Thomas knee splint, is used to maintain the abducted position for two months. The sound limb must be also abducted to fix the pelvis. The reconstruction operation requires high technical skill and may cause considerable shock. Therefore it should not be undertaken lightly

RACHITIC COXA VARA

This variety is uncommon. During infancy, when the incidence of rickets is highest, the neck of the femur is very short, mainly cartilaginous, has a wide angle, and is not subject to the same amount of weight-bearing as later on in childhood. When, however, rickets continues after infancy or recurs in late childhood, depression of the femoral neck may occur. The depression is of the whole length of the neck and is



Fig 5 -Diagram of rachitic coxa vara

commonly merely a part of general antero-lateral curvature of the shaft

The symptoms are those of coxa vara in generallimitation of abduction and internal rotation, shorten-

COXA VARA

ing of the limb and elevation of the trochanter, lordosis, and waddling gait. The disability may be slight and in the presence of other rachitic deformities the affection of the hip may be obscured.

While rickets is active, relief of weight-bearing through the hip is indicated and the hip should be abducted to correct deformity. This necessitates fixation in a Thomas abduction frame General treatment of rickets should also be carried out. When rickets is healed, subtrochanteric osteotomy may be done if the degree of depression of the neck is severe enough to warrant it

CONGENITAL COXA VARA.

A varoid deformity of the femoral neck present at birth without other defect of the limb is very rare Most cases of congenital coxa vara are associated with imperfect development of the upper end of the femur or deficient growth of the whole femur. The neck commonly is short but strong and without fibrous intersection. The depression is at the base of the neck and is not usually severe. Treatment is influenced by the associated defect of the shaft, for which an appliance may be necessary. If the deformity of the hip is itself disabling or hinders the wearing of an appliance, an osteotomy is indicated.

Reference
¹ Elmshe, R C "Coxa Vara," 1913

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treatment should take

It is usually urged by those who advocate surgical interference, that medical treatment as a rule fails and leaves the patient in a worse condition than before If we admit this, let us briefly consider what are the essentials to assure successful medical treatment —

(1) The correct diagnosis must be made (a) as regards the presence of an ulcer, and (b) as to the type and the position of the ulcer, if present (a) The symptoms of gastric and duodenal ulcer may be simulated closely in many other conditions, and these we must have in mind and exclude before subjecting our patient to the treatment For example, appendicitis, particularly in the young adult, not infrequently produces symptoms similar to those of a duodenal Little or no pain may be complained of in the appendix region, and unless the medical practitioner bears this in mind, he may be tempted to treat what he believes to be a duodenal ulcer and leave alone a chronically inflamed appendix. I have seen more than one case in which the correct diagnosis of appendicitis was made only after many weeks of treatment for duodenal ulcer, in which no improvement had been manifest. Phthisis is another disease which, in its early stages, may produce gastric symptoms and may be mistaken for gastric ulcer A history of the patient having brought up blood may still further mislead the practitioner, leading him to believe hæmatemesis to have taken place, whereas hæmoptysis had actually occurred Not infrequently gall-stones produce symptoms which are not unlike those of gastric ulcer. One must remember also that gastric ulcer and gall-stones may be present together in the same patient. These are but a few examples of conditions similar in their symptomatology to peptic ulcer It is obvious that no success may be obtained by medical treatment

The Medical Treatment of Gastric and Duodenal Ulcer.

By J BROWNING ALEXANDER, M.D., MRCP

Physician to the Prince of Wales's General Hospital, Tottenham, to the City of London Hospital for Diseases of the Heart and Lungs, and to St Mark's Hospital

T has long been a matter of dispute whether the treatment of gastric and duodenal ulcer should be medical or surgical. It is not surprising to find in this age, in which the tendency is unfortunately to define sharply the conditions that are amenable to surgical and those that are amenable to medical treatment, that there are enthusiastic advocates of surgical treatment as the only means of cure, and, on the other hand, physicians who claim that medical treatment alone often offers any chances of recovery. It is obvious, I think, to most clear thinking people that the treatment of gastric and duodenal ulcer may be either medical or surgical We cannot deny wonderfully beneficial results have attended surgical measures; but, at the same time, we are faced only too often with bad after-results of operations Given a suitable case for operation, there can be little doubt that in the hands of a competent surgeon the result will be satisfactory. But too often cases are subjected to what must be called a very radical operation, before it is determined whether the same, if not better results could be obtained by means of medical treatment. It is the object, therefore, of this article to discuss which cases are suitable for medical treatment and, secondly, what form that

GASTRIC AND DUODENAL ULCER

by the addition of liquor pancreaticus Carbohydrates in the form of dextrose we know are absorbed, and this should form the main part of rectal enemata; but it is obvious that even the most scientifically correct rectal feeding will not contain sufficient nutriment to maintain normal metabolism. Still further, it has been proved beyond doubt that rectal feeding produces a reflex flow of gastric juice—this is not in keeping with our attempts to secure physiological rest to the stomach

In cases in which there is acute ulceration associated with an increase in hydrochloric acid, our endeavour should certainly be to neutralize as far as possible that acidity. We must choose an alkali which will do this without causing a secondary secretion. It has been found that sodium bicarbonate is an extremely strong agent in producing a secondary flow of hydrochloric acid. It is therefore physiologically wrong and even harmful to employ this drug in attempting to give rest to the ulcer from the effects of the acid. The want of appreciation of this physiological fact has undoubtedly in many cases resulted in failure in the treatment of peptic ulcer. Again, failure has often been the lot of the physician because though being enthusiastic enough in neutralizing the acidity by day, he has neglected to keep the contents of the stomach alkaline during the night

(4) Another essential for successful treatment is that sufficient patience should be exercised by both patient and physician. It is sometimes extremely difficult to persuade the patient to submit to a rigorous course extending over three or four weeks of complete rest and probably a somewhat unsatisfying and monotonous diet. We should consider the chance of a typhoid case healing rather poor if we were to allow the patient to do things that are often permitted in the treatment of gastric conditions,

unless such conditions are excluded and a definite diagnosis of the presence of the ulcer is made before treatment is commenced (b) As to the type and position of the ulcer, a chronic ulcer situated at the pyloric end of the stomach and giving rise to obstruction and consequent gastric dilatation is obviously unsuitable for medical treatment. It is worth noting, however, that occasionally an acute ulcer with much edematous swelling around it may cause temporary partial obstruction and gastric dilatation, these manifestations disappearing after the edema has subsided as the result of medical treatment. Also the ulcer which has healed but has left much scar tissue and has produced an hour-glass stomach is not likely to benefit by any medical treatment.

- (2) Another essential for the successful treatment of peptic ulcer is careful attention to the presence of some septic focus elsewhere, such as in tonsils, teeth, gums, accessory sinus, gall-bladder and appendix. It is hopeless to rivet attention on healing an ulcer—no matter how acute it may be—if a primary septic foci is overlooked
- (3) A further essential for success is the appreciation of the fact that certain of the older methods of treatment in peptic ulcer are physiologically unsound. Rectal alimentation has in the past been too often employed with the belief that complete rest was being given to the stomach and the patient was being nourished at the same time. It is now well recognized that the scope of rectal feeding is distinctly limited. Proteins are absorbed scarcely at all, and yet the albumen of eggs is often a favourite ingredient of the so-called nutrient enema. Fats such as one would get from milk—another favourite ingredient—are probably not absorbed at all from the large bowel, unless in the presence of pancreatic juice. If they are given they should be predigested

GASTRIC AND DUODENAL ULCER

Early in the morning of the first day the patient receives $2\frac{1}{2}$ drachms of Rochelle salt (potassium and sodium tartrate) given in half a tumblerful of water This, with the cathartic of the night before, will effect as nearly as possible surgical cleanliness of the intestines.

Heat should be applied to the abdomen more or less constantly for ten days. I have found a very convenient way of achieving this is by means of antiphlogistine applied to the abdomen. No food is allowed for 48 hours. A glass of hot water with \frac{1}{4} teaspoonful of soda bicarb every four hours is given four times. The object of this is to clean off the mucus thoroughly from the inflamed duodenum and then to give the stomach and upper intestines absolute rest.

On the third day small quantities of nourishment should be given. The nourishment is given in small amounts so as not to cause distension of the stomach that is, 2 oz peptonized hot milk with an ounce of Vichy water, drunk slowly and given every three hours during the third day of treatment

On the fourth day 3 oz peptonized milk and 1 oz. Vichy water is given. Every six hours a glass of hot water should be given to wash out the stomach and duodenum. On this day the bowels should be moved by an enema and this should then be repeated daily until later in the treatment.

On the fifth day there should be three-hourly feeds of 5 oz peptonized milk and 1 oz Vichy water, alternating with 5 oz of thin strained oatmeal gruel given hot and followed by 2 oz. of warm Vichy water As the patient needs iron and is not receiving any meat, a three-grain tablet of saccharated oxide of iron should be given twice a day with the nourishment, over a period beginning with the fourth day of treatment.

On the sixth day the gruel should be continued,

Treatment has often failed when we have had every expectation of good results, because the patient has chosen to abandon treatment, preferring rather that the gastric ulcer should remain

Having now briefly considered some of the reasons why medical treatment of peptic ulcer often fails, I shall now briefly indicate what seems rational to ensure success by medical means First of all, the correct diagnosis as to the presence of an ulcer, its character and position must be established In doing this X-ray help is in all cases essential A careful search should then be made for any septic focus which may exist and that dealt with We should next be careful to explain fully to the patient what the treatment involves, and obtain his promise to submit himself to it for the necessary length of time Our next endeavour is to give the stomach physiological rest and keep the contents alkaline by means of suitably chosen drugs To accomplish all these objects different diets have from time to time been popular, and many good results in suitable cases have been recorded for the use of the Lenhartz diet, the Sippy diet, and more recently a method of duodenal feeding by a tube passed into the duodenum introduced by Einhorn The merits of these various forms of treatment need not be discussed here, but I would put forward briefly the method which I have myself employed during the last number of years with gratifying results

The patient must be confined to bed, and teeth, gums, mouth, tonsils, etc., if in bad condition, properly treated. On the first night the following cathartic is given —

B.	Hydrarg chlor	mıtı	В	-	-	-	grains	$2\frac{1}{2}$
•		-	-	-	-		grams	
	Sod bicarb	-	-	-	-	-	grams	10

This is taken at bed-time with a cup of milk,

Perforated Gastric and Duodenal Ulcers.

By R H ENOCH, M.R.C.S., L.R.C.P. Registrar, Cardiff Royal Infirmary

AND

D J HARRIES, DSc, MD, BS, FRCS Assistant Surgeon, Cardiff Royal Infirmary

URING the three years 1926-7-8, 109 patients with a perforated gastric or duodenal ulcer were admitted into the Cardiff Royal Infirmary Table 1 shows that perforation occurs far more frequently in males than in females, but it naturally throws no light on the relative frequency of unperforated ulcers in the two sexes

TABLE 1.

			G	astric	Duc	denal
			Male	Female	Male	Female
1926	-	~	17	4	15	1
1927	-	-	19	1	12	0
1928	-	~	25	0	15	0
7	otal	-	61	5	42	1

Table 2 shows that the average age at which perforation occurs is nearly a decade higher in the gastric than in the duodenal cases

TABLE 2

					Gastric	Duodenal
1926	~	-	-	~	49 yrs	40 yrs
1927	~	-	-	-	46 ,,	39 ,,
1928	-	~	~	-	45 ,,	33 ,,

It is curious that the youngest female admitted 451

and a raw egg on cracked ice should take the place of one milk feed. The other milk feeds should not be peptonized but given with Vichy water as before

After ten days there should be a gradual increase in the food. Two raw eggs may be given at first, later they may be cooked Malted milk, junket and gelatine, and, later, finely chopped fresh chicken are also allowed Still later, chopped beef may be given and the frequency of the feedings changed to five times a day, then to four times

After two weeks the enema should be stopped, and salts in the morning should be relied on to aid the movements of the bowels.

In addition to this dietetic treatment I give the following powder —

I drachm is given three times a day on the fourth day of treatment, increasing the doses to four on the fifth day, five on the sixth day, six on the seventh day and seven on the eighth day. These doses are continued with until the end of the treatment

After three weeks the patient is allowed to get up, for a longer time each day, and a month's rest at home is then advised. During convalescence I advise the patient to take ½ oz olive oil before each meal in order to diminish gastric secretion, and to avoid for a certain length of time anything in the nature of meat extracts, such as soups, which are stimulants to the production of hydrochloric acid

PERFORATED ULCERS

cases

TABLE 4

		Non-fatal	Fatal
Gastric -	-	- 45 yrs	48 yrs
Duodenal	-	- 37 ,,	45 ,,

No useful conclusions can be drawn from these figures. Naturally, the chances of recovery, as in other severe operations, are smaller in elderly patients than in the young and middle aged

Table 5 gives the average interval between the onset of perforation and the operation

TABLE 5

Gastric	•	-	Non-fatal 5 hours	Fatal. 10 8, if the three cases too ill for
				operation are excluded 7, if the case which died under the operation is also ex- cluded
Duodenal	_		10	9

It is generally agreed that the patient's chances diminish rapidly after the first 10-12 hours. Fortunately a large percentage of our cases were admitted early, as the above table shows, and this accounts for the absence of any striking difference in the figures in the above table. The average interval for duodenal cases is actually one hour less in the fatal than in the non-fatal. The gastric cases operated upon show an increase of two hours for the fatal cases, and this goes up to five hours if the three cases not operated on, and the case that died on the table are included. The above table does not give the impression that delay in operating was mainly responsible for the fatal results. Table 6 gives the various operative procedures and the results

was 49 years of age, but in view of the small number of females admitted (6) it would be unwise to connect the disease in any way with the climacteric changes

The next table shows the site of the ulcer

TABLE 3

			Gast	ric					
Anterior	surface ne	ar p	ylorus	-	-	•	-	-	44
,,) ,		esophag		-	-	-	-	4
,,,	,, ,	n	uddle d	of less	er cu	ırvatı	ıre -	-	8
11	,, n	ot ne	ear less	er cu	rvatu	re -	_	-	5
Posterior	surface n	ear j	oylorus	-	-	•	-	-	2
"	"	,, 1	mddle	of les	ser c	urvat	ure	-	3
	Total	-	-	-	-	-	-	-	66
			Duode	nal					
	surface of			-	_	-	-		42
Posterior	surface of	firs	t stage	-	-	-	-	-	1
	Total	_	_	_		_	_	_	43

This shows that the majority of perforations are on the anterior surface of the stomach or duodenum, and not far from the pylorus From the surgeon's point of view this is ideal, as the operative difficulties are much less than in perforations on the posterior surface or near the œsophagus. Chronic unperforated ulcers of the stomach are generally situated actually on the lesser curvature, and extend on to the anterior or posterior surface, or both They cause inflammatory thickening of the adjacent small omentum, and it is probable that this prevents perforation until the base of the ulcer has extended beyond this thickened area Adhesions to the stomach bed explain the rarity of posterior perforations Table 4 gives the average age in the fatal and non-fatal

PERFORATED ULCERS

nearly 10 years older than the duodenal; and the risk from any operation is slightly higher in the fifth than in the fourth decade The summary of the fatal cases indicates that extra-abdominal complications were absent in the duodenal cases, but in the gastric cases, in nine out of twenty-one, death was due to the extra-abdominal complications, mainly pulmonary In a duodenal perforation the escaping fluid tends to flow to the right above the transverse colon, then down along the outer side of the ascending colon into the pelvis, with the result that the portion of the abdominal cavity occupied by the small intestine is not soiled in the early stages. Moreover, a reflex spasm of the pylorus prevents the stomach from emptying itself into the duodenum In a gastric perforation there is a greater tendency for the escaping fluid to flow down, over the transverse colon, directly on to the small intestine This fluid is acid, more irritating to the peritoneum and probably more septic than the fluid escaping through a duodenal perforation spasm is obviously a disadvantage in a gastric per-foration. These factors probably account for the difference in the prognosis and in the liability to pulmonary and other complications in the two lesions

- (2) The prognosis is largely influenced by the nature of the operative treatment, provided this is carried out in the first 10-12 hours after perforation. Table 6 shows that 55 cases treated by suture of the ulcer, with or without gastro-jejunostomy, swabbing out the peritoneal cavity and no drainage, gave a mortality rate of 7½ per cent. The gastro-jejunostomy had a beneficial effect in the gastric cases, but the reverse effect in the duodenal.
- (3) The mortality rate is raised by drainage of the peritoneal cavity. The table shows this to be

obtained from each.

TABLE 6.

	Gastric		Duodenal		Per- centage	
	Total	Died	Total	Died	of Deaths	
(1) Suture of ulcer, no dramage (2) Suture of ulcer, gastro-	18	2	12	0	61%	
jejunostomy, no dramage	11	0	14	2	8%	
(3) Suture of ulcer, lavage, no dramage	1	1	0	0		
(4) Suture of ulcer, supra- public dramage (5) Suture of ulcer, gastro-	18	5	10	2	25%	
jejunostomy, supra-pubic drainage	2	0	1	1	33%	
(6) Suture of ulcer, local dramage - (7) Suture of ulcer, Finney's	10	7	4	0	50%	
operation, supra-puble drainage (8) Suture of ulcer, jejunostomy, supra - puble	0	0	1	0		
dramage (9) Suture of ulcer round a	0	0	1	0		
gastrostomy tube (10) No operation (11) Died on operating table -	2 3 1	2 3 1	0 0 0	0 0 0		
Total	66	21 or 32%	43	5 or 11½%	24%	

From the above table the following conclusions can be drawn.—

(1) The death rate from gastric perforations is much higher than from duodenal perforations. in this series 32 per cent. and 11 per cent. respectively Table 5 shows that this difference cannot be due to delay in operating on the gastric cases Table 2 shows that the gastric cases were, on the average,

PERFORATED ULCERS

16 hours after operation, from peritonitis.

(8) Male, 44 years, transported 0 miles, perforated 1 hour Operation, suture of ulcer, on anterior surface near middle of lesser curve, no drainage Death 15 days after operation, from hæmatemesis

(9) Male, 55 years, transported 25 miles, perforated 25 hours Operation, laparotomy Death on table, pulseless on admission

(10) Female, 68 years, transported 0 miles, too collapsed for

operation. Death 12 hours after perforation

(11) Female, 53 years, transported 1 mile, perforated 4 hours Operation, suture of ulcer, on anterior surface near pylorus, no drainage Death 13 days after operation, from acute parotitis

(12) Male, 41 years, transported 2 miles, perforated 8 hours Operation, suture of ulcer, on anterior surface near pylorus, supra-public dramage Death 5 days after operation, from acute

pneumonia

(13) Male, 49 years, transported 2 miles, perforated 2 hours Operation, suture of ulcer, on anterior surface near middle of lesser curve, local drainage Death 8 days after operation, from progressive weakness This ulcer proved to be malignant

(14) Male, 60 years, transported I mile, perforated 6 hours Operation, suture of ulcer, on anterior wall near pylorus, local

dramage Death 13 days after operation, from a fatty heart

(15) Male, 51 years, transported 1 mile, perforated 8 hours Operation, suture of ulcer, on lesser curve near æsophagus, local

drainage Death 8 days after operation, from peritonitis

(16) Male, 48 years, transported 8 miles, perforated 11 hours Operation, suture of ulcer, on anterior surface near pylorus, local dramage Death 48 hours after operation, from shock and peritonitis

(17) Male, 40 years, transported 1 mile, perforated 14 hours Operation, suture of ulcer, on anterior surface near pylorus, local drainage Death 36 hours after operation, from shock and

pentonitis

(18) Male, 33 years, transported 1 mile, perforated 6 hours Operation, suture of ulcer, on anterior surface near pylorus, supra-public drainage Death 6 days after operation, from ileus for which enterostomy was done 2 days before death

(19) Male, 44 years, transported 1 mile, perforated 14 hours. Operation, suture of ulcer, on anterior surface near pylorus, lavage supra-public dramage. Death 6 hours after operation, from shock

- (20) Male, 44 years, transported 20 miles, perforated 48 hours. Too collapsed for operation Death 6 days after perforation, from peritonitis, pericarditis and pyæmia due to an ulcer on middle of lesser curve
- (21) Male, 48 years, transported 30 miles, perforated 27 hours. Too collapsed for operation Death 4 days after perforation, from peritonitis and pleurisy due to an ulcer on the anterior surface near pylorus

Remarks—In 12 out of the 21, death was due 457 G G

25 per cent with supra-pubic, and 50 per cent with local or supra-umbilical dramage It might occur to the reader that, possibly, only the worst cases were drained This was not the case Some of the surgeons never drained, while the others almost invariably drained the peritoneal cavity for 24 hours or longer

(4) The 50 cases treated by operative procedures other than the first two shown on Table 6, had a mortality rate of 34 per cent If the three cases that died without operation, and the case that died on the table are included, the rate becomes 39 per cent

SUMMARY OF THE FATAL CASES

(1) Male, 57 years, transported 3 miles, perforated 9 hours before operation Nature of operation, suture of ulcer, on anterior surface near pylorus, no drainage An empyema, communicating with the abdomen by a perforation through the diaphragm, was drained on the 8th day Death on the 20th day, from peritonitis and empyema

(2) Male, 37 years, transported 1 mile, perforated 8 hours before operation Operation, suture of ulcer, on anterior surface near middle of lesser curve, round a gastrostomy tube, no drainage An empyema was drained on the 21st day Death on the 23rd day,

from peritonitis and empyema

(3) Male, 43 years, transported 2 miles, perforated 3 hours Operation, suture of ulcer, on anterior surface near middle of lesser curve, local drainage Death 4 days after operation, from peritonitis

(4) Male, 56 years, transported 1 mile, perforated 8 hours Operation, suture of ulcer, on anterior surface not near lesser curve, lavage of abdominal cavity, local drainage Death 5 days

after operation, from peritonitis

(5) Male, 59 years, transported 6 miles, perforated 10 hours Operation, suture of ulcer, on anterior surface near pylorus, lavage, supra-public drainage Death 2 days after operation, from pneumonia

(6) Male, 50 years, transported 2 miles, perforated 3 hours Operation, suture of ulcer, on posterior surface near middle of lesser curve, supra-public drainage Death 5 days after operation,

from hæmatemesis and pneumonia

(7) Male, 53 years, transported 1 mile, perforated 11 hours Operation, suture of ulcer, on anterior surface near middle of lesser curve round a gastrostomy tube, lavage, no drainage Death

Recent Advances in the Treatment of Pulmonary Tuberculosis.

BY PHILIP ELLMAN, M.D., M.R.C.P.

Tuberculosis Officer, County Borough of East Ham, Honorary Clinical Assistant to Out-Patients, Royal Chest Hospital

N considering the treatment of pulmonary tuberculosis it is essential at the outset to emphasize a point which my former chief, Dr Marcus Paterson, has insisted on for many years. It is that pulmonary tuberculosis manifests itself, like all other infections or bacterial diseases by (1) a local inflammatory lesion confined to the lung, and (2) a constitutional disturbance due to the absorption of bacterial products from the primary focus into the systemic circulation If this discharge of bacterial products into the blood-Wright's "auto-moculation"—can be controlled, we have overcome the greater part of the difficulty in the treatment of pulmonary tuberculosis Too much significance should not be placed on the extent of the pulmonary lesion at the expense of the amount of systemic disturbance. In fact, the local condition of the lung must be taken in conjunction with the general condition of the patient, following a definite period of observation, before assessing a prognosis On the other hand, one sees single small foci in the lung producing much general systemic disturbance. and such auto-moculations may be extremely difficult to control These basic principles are of real importance when we come to consider the question of treatment

In an article of this nature I consider it appropriate that some reference, at least, should be made in 459 GG 2

to the complications inside the abdomen. Of the other nine, seven had pulmonary complications, one fatty degeneration of the heart; one septic parotitis. In these nine cases the complications were mainly responsible for the fatal result. This explains to some extent why the death rate in gastric cases is three times that in the duodenal

Duodenal ---

(1) Male, 61 years, transported 10 miles, perforated 13 hours before operation Operation, suture of ulcer, on anterior surface of first stage of duodenum, supra-public dramage Death 24 hours after operation, from shock and peritonitis

(2) Male, 40 years, transported 30 miles, perforated 8 hours Operation, suture of ulcer, on anterior surface of first stage of duodenum, posterior gastro-jejunostomy, supra-public drainage

Death 2 days after operation, from peritonitis

(3) Male, 60 years, transported 2 miles, perforated 6 hours Operation, suture of ulcer, on anterior surface of first stage of duodenum, supra-public drainage. Death 18 days after operation, from progressive weakness and terminal diarrhea

(4) Male, 45 years, transported 25 miles, perforated 17 hours Operation, suture of ulcer, on anterior surface of first stage of duodenum, posterior gastro-jejunostomy, no dramage Death 48 hours after operation, from peritonitis with distension of

abdomen

(5) Male, 18 years, transported 1 mile, perforated 2 hours before operation. Operation, suture of ulcer, on anterior surface of first stage of duodenum, posterior gastro-jejunostomy, no drainage. Heus supervened on the 14th day, enterostomy done. Death on the 18th day, from progressive weakness and toxemia.

Remarks—It is interesting to note that, apart from the general effects of toxemia, there were no complications except those which occurred inside the abdomen

We are indebted to other members of the surgical staff of the Cardiff Royal Infirmary for permission to include their cases in this review.

torium life is, in essence, a training, physical and mental, brought about by meticulous attention to routine and discipline in carrying out the treatment of a system of very carefully graduated rest and exercise, equal attention being paid to the value of rest and exercise, under constant medical supervision It is an open-air life together with a unique training in personal and general hygiene and dietetic measures, which the serious patient can never forget and which will serve him well throughout the larger postsanatorium life Its three primary objects are (a) To raise the patient to his highest known weight, (b) to raise his resistance to enable him to do the highest amount of work without producing any constitutional disturbance; (c) to stop the discharge of sputum The average length of treatment should be at least one year If the correct type of case be chosen and if the patient on his return from the sanatorium will carry on its treatment, adapting its lessons to his new environment under his own practitioner's supervision, then the permanent value of sanatorium treatment in pulmonary tuberculosis will be found to be really amazıng

Collapse Therapy —This more recent advance in the treatment of pulmonary tubercle is unquestionably, in the correct type of case, one of the greatest advances in medical treatment of recent years — There are three essential forms of collapse therapy. These are —

(a) Artificial pneumothorax, (b) phrenic evulsion, and (c) thoracoplasty.

Artificial Pneumothorax —This form of treatment is now becoming extremely popular. In selected cases, which have, as a general routine been under careful observation, excellent results are obtained, especially if combined with sanatorium treatment. The latter treatment, when in conjunction with artificial pneumothorax, need not be quite so pro-

conjunction with the recent advances in the treatment of pulmonary tuberculosis, to a well established form of treatment, results of which are often misrepresented because the cases have not been judiciously selected I refer to the sanatorium treatment of pulmonary tuberculosis. I do not wish in any way to minimize the enormous advantages we now possess in the treatment of carefully selected cases of pulmonary tuberculosis by, for example, artificial pneumothorax or thoracoplasty, but I do wish to emphasize the following points —

- (1) That cases for the more recent advances in treatment must be selected judiciously if such valuable forms of treatment are not to fall into disrepute
- (2) That every case of pulmonary tuberculosis should be kept under a short period of observation before the form of treatment is decided upon.
- (3) That, with all the recent advances at our disposal, I am convinced that there are comparatively few early cases of pulmonary tubercle that will not respond successfully to strict sanatorium treatment

With regard to treatment, given a case of pulmonary tubercle, we have at our disposal (a) sanatorium treatment, (b) collapse therapy in conjunction with sanatorium treatment, and (c) sanocrysin, with or without collapse therapy and sanatorium treatment

Sanatorium Treatment—This is very much misunderstood and hence it is inclined to be misrepresented. Now, sanatorium treatment, carried out on the lines introduced by Marcus Paterson at Frimley in 1905, does not merely consist of a home for rest and fresh air. It should consist primarily of a very carefully controlled system of graduated rest and exercise regulated under strict medical supervision. It is hardly necessary to go into details of the method of treatment here, but I may refer my readers to Marcus Paterson's original work on the subject. The sana-

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valuable in basal tuberculosis and as an aid to artificial pneumothorax treatment to check the recurrence of effusions, and not infrequently it has been found that the length of the intervals of refill can be much increased as a result of paralysis of the diaphragm. As a preliminary form of treatment to thoracoplasty, it not infrequently happens that following this minor operation the condition has so much improved that the larger operation has been found to be unnecessary

Thoracoplasty—This major operation cannot undertaken lightly, and should only be done surgeons with special experience of surgery in relation to diseases of the chest The operation may be performed in one or two stages In this country, Morriston Davies2 prefers the one-stage operation, while Tudor Edwards³ prefers a two-stage operation; but in expert hands successful results are obtained by both schools The indications for thoracoplasty are fairly well defined In the first place, the disease should be unilateral The most suitable type of case is generally assumed to be the unilateral case of fibroid tubercle with cavitation and bronchiectasis, where adhesions are so numerous that artificial pneumothorax treatment is quite impossible. Where an artificial pneumothorax is attempted and where, because of adhesions which are too numerous for cauterization through a thoracoscope, the pneumothorax cannot be continued, then a thoracoplasty, other things being equal, should be considered. The contra-indications are heart and renal failure, tuberculous ententis. diabetes, and advanced tuberculous laryngitis affecting the epiglottis A fairly good general condition, free from gross systemic disturbance is essential. tuberculous laryngitis is, as with pneumothorax, no contra-indication to treatment—in fact, the lesion in the larynx is not infrequently benefited

The great advantage of a thoracoplasty is the

longed. The following are the indications for artificial pneumothorax treatment:—

- (1) Where, in an early case which has been under the routine preliminary observation with a view to sanatorium treatment and where, despite the strictest form of absolute rest the patient runs a temperature at the slightest provocation, artificial pneumothorax treatment is indicated
- (2) In a unilateral case of pulmonary tubercle, where the lesion in the diseased lung is progressing despite the strictest sanatorium treatment
- (3) With repeated hæmoptyses, if one is certain of the diseased lung responsible, artificial pneumothorax is indicated, if necessary, as an emergency treatment.
- (4) In certain persistent cases of tuberculous pleurisy with effusion, a gas replacement is very successful.
- (5) In the chronic fibrotic type of case, with existing or threatened bronchiectasis

Contra-indications to this form of treatment include cases with tuberculous enteritis, cardiac or renal failure, asthma, emphysema in the opposite lung, and individuals of a highly nervous temperament, who will dread every refill. Summing up, artificial pneumothorax treatment, under the circumstances outlined, as an adjunct to the treatment of pulmonary tuberculosis, is one of the greatest instruments for good at the present time; but it must be remembered, in view of our conception of pulmonary tuberculosis, that it is not a substitute for general routine treatment at a sanatorium

Phrenic Evulsion—This operation, which is a comparatively simple procedure and done under local anæsthesia, serves to paralyse one dome of the diaphragm, thereby inducing a basal collapse. It may be done as an independent form of treatment or as a preliminary to thoracoplasty. It is particularly

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opposed to the chronic fibrotic type of disease. There can be no doubt that the indiscriminate use of sanocrysin does harm, but that in carefully selected cases, a favourable response can be obtained

A course of treatment with sanocrysin usually lasts from 5 to 6 weeks The beginning doses for an adult should be somewhat as follows At intervals of three days, providing there is no reaction, 0 05, 0 1, and 0 25 gram If there is a reaction, wait until this has subsided and then repeat the same or the dose previous to the one producing the reaction At weekly intervals, under the conditions just outlined, give 0 4, 0 6, 0 75 or 0.85 gram, and if the patient is in really good condition, even I gram may be given. Under such a routine, provided that the patient is showing a favourable response there is a striking diminution in the quantity of sputum and the number of tubercle bacilli, a positive sputum often becoming negative severe febrile reactions, gastro-intestinal disturbance, marked and persistent albuminum and always with dermatitis, the treatment should be discontinued Heaf,5 who has had considerable experience with sanocrysin, suspends treatment as soon as the patient begins to lose weight, recommencing with a smaller dose after the loss of weight has been regained also states that sanocrysin is well tolerated by children The amount of sanocrysin given in one course of treatment for an adult is 5 to 6 grams, and the final dose may be repeated until the 5 or 6 grams has been given.

Calcium and Parathyroid Therapy—There is an enormous amount of literature on the value of calcium therapy in pulmonary tuberculosis, and in view of the formation of calcified tubercles as part of a healing process, this is not surprising During 1926—1927, while in the tuberculosis service of the Metropolitan Asylums Board, I carried out some investigations on

permanency of the collapse and the freedom from the necessity of refills, but it must be remembered, on the other hand, that a pneumothorax is a comparatively simple procedure and that the collapse is not necessarily permanent. There can be no doubt, however, from some of the results one has seen of thoracoplasty, that it has a distinct position as a mode of treatment of pulmonary tuberculosis. Given the carefully selected case and the surgeon who is familiar with this branch of surgery, the result can be very striking

Cauterization of Adhesions—A brief reference must be made to this procedure, which has made artificial pneumothorax treatment more possible. We owe the possibility of this procedure to Professor Jacobeus, of Sweden, who through his thoracoscope has made the cauterization of adhesions a comparatively simple procedure. The instrument is similar to the cystoscope, and by local anæsthesia it is introduced into the pleural cavity, the adhesions being viewed through the thoracoscope before cauterization

Sanocrysin—Professor Møllgaard, of Denmark, first introduced the intravenous injection of a double thiosulphate of gold and sodium, "sanocrysin," some five years ago, after careful experimentation on animals Since that period it has been tried fairly extensively throughout the medical world, but it has suffered in reputation, it would appear, for two reasons (a) for having been used in unsuitable cases, and (b) for having been used in too large doses. From their experiences with sanocrysin, observers like Burrell⁴ in England, and Gravesen⁶ in Denmark, who have had considerable experience of the drug as an aid to treatment, are of the general opinion that sanocrysin should be used essentially where there is a fresh area of spreading disease—what is more frequently referred to on the continent as the exudative type of disease, as

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oil for the phthisical subject to the same extent.

Conclusions -In my opinion the position of sanatorium treatment has in no way been affected by more recent advances in treatment If anything, it holds a more predominant and increasingly useful position. for the recent advances are mainly concerned with the pulmonary lesion-only one aspect in the treatment of pulmonary tuberculosis—therefore, these admirable forms of treatment should serve as an adjunct to sanatorium treatment which also seeks to bring the patient to the highest possible state of physical fitness, so that the body can be prepared, at any emergency, to produce its own antibodies to control any excess of auto-moculations In fact, it would appear that with our recent advances in treatment we are endeavouring to convert a later, complicated case of phthisis to a comparatively early, uncomplicated and more controllable lesion, which is then eminently suitable for sanatorium treatment. The utilization of any surgical measure in phthisis does not diminish the importance of the sanatorium regime, and no doubt the time is approaching when every sanatorium will be properly equipped for cases requiring collapse therapy, so that these therapeutic measures may be carried out under the best possible conditions.

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the correlation of calcium metabolism, parathyroid function and pulmonary tuberculosis 8 My experiences led me to believe that calcium therapy alone or aided by extract of parathyroid, given over a sufficiently long period, did promote calcium retention, especially in the decalcified type of case where the blood-calcium level-which, although I always found to be within normal limits (9 to 12 mgms per 100 c cm)—could be raised from its normal minimum to normal maximum concentration point with correspondingly good results In a few febrile cases, which had proved resistant to other methods, I found that a course of six intravenous injections of 5 c cm of a 10 per cent solution of calcium chloride produced an amazing improvement in the general condition, rendering a positive sputum negative as with sanocrysin No doubt this was due to what Burrell has described as "shock tactics" in the treatment of pulmonary tuberculosis 7

Cod-Liver Oil — The use of cod-liver oil as a therapeutic measure should be mentioned I believe it to be most valuable, if it can be taken without any gastric It owes its properties, we now know, to its vitamin A and D content Vitamin A has been proved to increase the pulmonary resistance to infection Samson Wright⁹ states that the content of Vitamin A in lung tissue varies directly with the amount in the ingested food, and he suggests that it is possible that the deficiency of this vitamin may predispose to the development of pulmonary tuberculosis and other lung diseases in man we know, is concerned with calcium metabolism believe that in pre- and post-sanatorium life, if taken regularly, especially during the winter months, codliver oil does aid resistance to respiratory catarrhal infections and so prevent the serious risk of lighting up a quiescent or arrested focus of disease healthy sanatorium life does not necessitate cod-liver

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observation of thirty-five cases at the Brompton Hospital over a period of a year (1927-28), I am indebted to my chiefs, Dr L S. T Burrell and Dr F H Young, for permission to make use of this material. In this series of cases, no attempt at selection was made, but rather an heterogeneous group was given the treatment, in an endeavour to study the effects of the drug

Dosage -In the early days of this, as in the case of many another form of new treatment, doses were used which would now be regarded as heroic, for they were followed by violent and dangerous reactions and many fatalities Secher still advocates large doses, but most clinicians are opposed to his advice (Wurtzen and Sjorslev, Rist, Banand, Faber) dosage employed in the cases given in this paper was as follows 01, 025, 05, 075, 1, 1, 1 gramme at weekly intervals. There was not, however, any slavish adherence to this routine, each patient was considered as an isolated therapeutic problem. best results were produced when a slight reaction eg an evening rise of temperature, followed each dose, our aim was to adjust each dose to produce such an effect, whilst for the greater number of patients the routine dosage sufficed, others demanded greater caution when one dose gave rise to a marked reaction, there was no increase, and even diminution of the size of the next In a few cases of especial severity, small doses, 0 1, 0 25 grammeat weekly intervals, were used. The need for individualization of the dosage cannot be over-emphasized

The interval between doses, especially the larger ones, should be kept at a minimum of seven days On the analogy of the arsenical treatment of syphilis, two or more courses of gold were given in nine cases

Administration was usually by the intravenous route, but in a smaller number of cases resort had to be made

The Treatment of Pulmonary Tuberculosis by Sanocrysin.

BY CEDRIC SHAW, M.A, MB, MRCP

NVESTIGATION of the therapeutic possibilities of gold in pulmonary tuberculosis originated m the statement made by Koch, m 1890, that it inhibited the growth of the tubercle bacillus in vitro, in a concentration of 1-1,000,000. Bruck and Gluck used potassium auriocyanide clinically, and Feldt and Spies, auriocanthan and crysolgan; all three were discarded because of the dangerous reactions and intoxications induced by them In 1924 Møllgaard, of Copenhagen, published a preliminary report upon the use of sodium auriothiosulphate (sanocrysin) in artificially produced and spontaneous animal tuberculosis, his results were startling enough to revive interest in the gold therapy of human tuberculosis Strong confirmation of its value in experimental tuberculosis came from the extensive researches of Madsen and Morch and of Cummins, conversely, all the French workers deny that the gold salt has any but a metallic toxic action. Despite the academic niceties of this question, for the clinician, the all important fact must remain that positive results have been obtained on the experimental side, and these are of such a nature as to justify an exhaustive examination of its possible clinical potentialities. Nobody who reads Madsen and Morch's paper can fail to arrive at a similar conclusion

The material for this paper is taken from the 468

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tuberculosis there is not unanimity. By some it is hailed as a valuable addition to the poorly-stocked armoury of anti-tuberculosis measures, by others it is indicted as valueless and dangerous Secher goes so far as to claim to have obtained a "cure" in a very large proportion of mild cases, and in a smaller one of cases of severer type Saye is encouraged by 23 good results in a series of 32 cases, he finds the X-ray improvement to be the striking feature. Barnand has observed 26 cases, all of whom were first watched for signs of spontaneous improvement In 9, with a recent history, ulcero-caseous disease, extreme toxemia, and a grave prognosis very marked improvement was seen, and this was confirmed by carefully controlled X-rays, in 8 a great improvement was found, but for one reason or another this could not be entirely attributed to sanocrysin. 7 cases gave no result (terminal chronic fibroid phthisis or subacute disease), 2 cases were worse Von Bie and Anderson reported 26 cases of acute pulmonary tuberculosis treated with sanocrysin, against a similar group of 28 cases untreated and used as controls. Their results were as follows --

	Untreated controls	Sanocrysin group
Died	18	7
Desperately ill	5	0
Discharged better	5	0
Discharged much improved	0	16
Free from symptoms	0	3

Wurtzen and Sjorslev, in a similar comparison (save that the cases were of all types, and chiefly belonging to groups II and III of the Turban classification), give the following results —

	Improved	Unaffected	Worse	\mathbf{Dead}
145 treated cases 101 untreated cases	98 37	3 10	$\frac{20}{27}$	24 27

Further, they concluded that the permanent results,

by the intramuscular, this is not the method of choice.

The phenomena following an injection in this series were.—

Anorexia, nausea, and general malaise, for twenty-four hours In nearly all	41
	tne cases
Rise of temperature on evening of injection,	
lasting a few hours 23 cases 60	o per cent
Rise of temperature only after third or	
fourth injection (delayed reaction), lasting	_
for several days and falling by lysis 3 ,, 5 Absence of temperature 8 23	
	3,,
Albuminuria	
(a) Faint haze on boiling, lasting for	
two or three days only no casts 8 ,, 23	,,
(b) Persistent heavy cloud associated	
with casts 1 case 3	,,
Skin rashes	
morbilliform 1 case	
-papulo eryth 1 case 3 cases 9	,,
-exfol -dermat 1 case	
Stomatitis and pharyngitis 2 cases 6	,,
Persistent metallic taste 1 case 3	21
Vomiting, 2-3 times, during twelve hours 8 cases 23	"
Transient diarrhœa (2-3 loose motions a	
day for 2-3 days) 10 ,, 30	"
Focal reaction ("tightness" of chest,	
dyspnœa, and increased moistness of	
physical signs for twenty four hours) 4 ,, 12	,,
Disappearance of tubercle bacilli from	
sputum, for periods of six weeks to three	
shunning for horizons of six weeks to muco	

It will be seen that the phenomena common after a dose of sanocrysin are an evening rise of temperature, mild, general constitutional symptoms, a transient gastro-intestinal disturbance, or a transient albuminuma. With a moderate dosage, symptoms which might be interpreted as dangerous, occurred only in a minority of the cases, i.e. persistent albuminums in one case and skin rashes in three. These facts strongly militate against the common belief that sanocrysin is a dangerous drug. The much-feared and talked-of shock did not occur in any case.

THE RESULTS OF SANOGRYSIN TREATMENT.

Upon the value of sanogrysin therapy in pulmonary

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toute action curative, soit spécifique, soit indirecte. Vis-à-vis de la tuberculose, il se comport comme une substance indifférente, et les accidents qu'il provoque a l'occasion (dans un proportion trop élèvée de cas pour qu'on puisse regarder inoffensif) sont uniquement fonction de sa toxicité métallique"

In our series of cases the criteria upon which improvement was judged were three: general symptomatic improvement; changes in the physical signs towards fibrosis, and diminution in the number with alteration of the quality of the crepitations heard; changes in the X-ray appearances, towards clearing of the lung field, and hardening of all adventitious shadows A flat temperature, diminished or absent cough and sputum, absence of lassitude, a good appetite and increasing weight, connoted "general symptomatic improvement." In most of the cases in which improvement is claimed to have occurred, all three criteria were satisfied, in a few only two of the three; in three cases, whilst general symptomatic improvement and improvement in physical signs was very marked, the X-rays suggested an increase of the disease Such a combination has been described by another writer also

The results in our series were as follows -

Much improved - - 9 cases.

Improved - - - 12 cases
Unaffected - - - 9 cases.

Worse - - - 5 cases.

--35 cases.

In the nine cases classed as "much improved" there are certain features of importance in common:—

(1) They were all young subjects, the ages of seven lay between 14 and 25 years, one was 33,

based on fitness for work two to three years after treatment, showed that the treated cases maintained their superiority over the untreated ones.

Oekonomopoulo has treated 13 cases, all slightly febrile, with physical signs and X-ray appearances of recent disease, and has obtained these results —

Much improved, 5 Slightly improved, 3 Definitely improved, 3 Stationary, 1 Worse, 1

Lyon decides that treatment is of value in that improvement in the temperature is a definite effect, and that further trial is advisable.

Faber has an interesting comparison in the results obtained by large doses and small ones

Gp I. large doses Gp II small doses

Apparently well	2	4
Much improved	7	7
Improved	12	15
Unchanged	12	2
Worse	2	0
Dead	7	3
	42	31

The further history of the patients classed as "apparently well" or "much improved" (in the case of Group I, 2-2½ years, and of Group II, 1-2 years, after treatment) shows that all are free from symptoms, and have a full capacity for work.

Sergent, Bordet, and Durand, conclude that all the results obtained with sanocrysm, are obtainable with considerably less risk by the usual sanatorium treatment Bezançon, Braun and Azoulay concur in this opinion

Rist denounces the treatment in these words: "Nous pensons plutôt que le medicament s'est montre, tout au moins chez le plus grand nombre de tuber-culeux, auxquels nous l'avons appliqué, dépourvu de

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the general condition, physical signs, and X-rays was observed in as short a period (considering the amount of disease) as two to three months. It is impossible to compute the period in which ordinary methods would have achieved corresponding results, but one feels sure it would have been considerably longer

Of the nine cases classed as "not affected," all but two showed a considerable degree of fibrosis, and had histories extending over many years. One of the two exceptions had very extensive recent infiltration, and was country born and bred, a fact which vitiates the possible efficacy of any form of treatment, the other case was complicated by a spontaneous pneumothorax, and although she improved enormously, her stay in hospital was so long as to make an assessment of the sanocrysin result alone, difficult

The five cases classed as "worse" were all in such an advanced stage that the prognosis was hopeless before treatment was initiated

It seems justifiable to conclude that in this series sanocrysin has given positive good results in 21 cases out of 35, and if the five cases adjudged hopeless from the start be excluded the percentage is raised from 60 to 70; one is therefore in agreement with Mayer "

on trouvera tout de même dans la sanocrysine une médicament utile. Administre à bon escient et avec prudence il pourra parfois rendre au phthisologue désarme de réels services"

From these results it would seem that cases with short histories and recent disease of the "exudative" type are especially suitable for the treatment, and particularly when the subjects are young adults; in certain cases an acute exacerbation of chronic disease reacts favourably. Slowly progressing chronic fibroid phthisis appears to be almost uniformly

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another, 44.

- (2) All, save one case, gave an history of definite symptoms for less than six months
- (3) All were febrile and toxic
- (4) All had extensive recent bilateral disease.
- (5) In all the prognosis was of the utmost gravity Despite these features—each of which, save (2), contributes to the gravity of a case—all these patients were rendered fit for Grade A sanatoriums in periods varying from three to six months. Two were especially striking: the first was a girl of seventeen, whose six immediate relatives had died of phthisis in the last 15 years, the second was admitted, more or less as a favour, nearly moribund. Tuberculosis is a disease of unexpected happenings, but these nine cases all appeared to be outside the possibility of spontaneous improvement to the degree shown by them

The twelve cases classed as "improved," whilst not as spectacular as those of the former group, would also appear to indicate a positive result from the treatment. They are placed separately, however, because their prognosis on admission, though anxious, was not so grave as that in the former group, so that the results obtained could reasonably have been expected from ordinary methods of treatment average age in this group is slightly higher than in the former-27 years, of the twelve cases, four were exacerbations of chronic bilateral disease, the rest gave an history of symptoms extending over three months to one year, and had bilateral infiltration, the majority showing some tendency to fibrosis as well; they were all febrile. It has been said that these cases were of such a nature that favourable results might have been expected from sanatorium treatment alone, but a positive effect is claimed for the sanocrysm upon the question of the time factor In all these cases a very definite improvement in

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shown that if sanocrysin is administered at the same time as the infecting dose in rabbits the curative effect is not produced, and, moreover, the possible results from subsequent doses are negatived, a latent period of from 5-7 days is necessary between the mfeeting dose and the first injection of sanocrysin, in order that the curative effect may be obtained Clinically it has been noted that in many cases of chronic fibroid phthisis very large amounts of sanocrysin fail to provoke a reaction of any sort, Secher interprets this as being due to the mability of the gold to reach the organisms, and effect their lysis, because of the intervention of the dense fibrous tissue barriers That there is a fallacy in this assertion seems to be shown by the fact that in eight of our cases, all with extensive areas of fresh nonfibrotic infiltration, no reaction could be obtained Oekononpoulo has made a similar observation

The majority of the French workers hold that sanocrysin is ineffective both in experimental and spontaneous tuberculosis, and that the phenomena consecutive upon its administration are manifestations of metallic intoxication. To this extremist view there are many valid objections Thus Møllgaard has shown that large amounts may be given to normal animals without the production of any symptoms and the rapid excretion of the gold; Secher has demonstrated the same to be true in cases of fibroid phthisis. There is also the important work of Frandsen showing that sanocrysin differs from lead, mercury and chromate, in that enormous doses do not induce nephritis in rabbits Of a more positively contradictory nature is the extremely careful work of Madsen and Morch, which shows definitely that curative fibrosis is produced in artificially induced rabbit tuberculosis

It seems logical to infer that the theory of simple

unaffected by the treatment as we have conducted it. Mayer (Nelis) is substantially in agreement with these conclusions, and so is Barnard Secher, von Bie and Andersen report good results in the acute disease but add that cautious dosage is essential Saye believes that all forms of pulmonary tubercle of recent origin and exudative type are especially amenable to the therapy. Kistrup and Secher think that pleurisy is especially suitable for sanocrysin because of the vascularity of the diseased area, and because it is the only radical means of attacking the incipient pulmonary infection

THE MODE OF ACTION OF SANOGRYSIN.

The mechanism by which sanocrysin produces its effects is a matter of controversal uncertainty. Møllgaard's conception is that the drug exerts a simple specific bacteriolytic action, and the symptoms resultant upon its exhibition are due to the consequent release of endotoxins of the nature of tuberculin Secher supports this thesis warmly on the clinical side, and quotes Koch, Strebbing, Leyden, Trendelenburg, Henoch, Gerhard, and Goene to show the similarity between tuberculin and sanocrysin There are, however, several facts which reactions seem to indicate that this explanation by simple specific bacteriolysis is incorrect. Thus it has been amply shown (Bang, Calmette, and others) that the inhibitory effect of sanocrysin upon the growth of tubercle bacilli in intro is negligible, or varies considerably with the strain of organism and culture medium employed (Madsen and Morch): no substance toxic to guinea pigs is liberated by the contact of sanocrysin with tubercle bacilli in vitro (Calmette, Roquet, and Negre) Madsen and Morch have made an observation which appears to put out of court any question of simple bacteriolysis; they have

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and on the other by stimulating fibrosis it enhances the effect of defensive mechanisms already at work? One possible fallacy in the speculation is the question of clearing the sputum of organisms—do they really disappear, or do they merely lose their acid-fastness and so become indemonstrable by ordinary staining methods? In support of this thesis of tissue reaction is the fact, demonstrated by one of Madsen's pupils, that tuberculous tissue has a greater affinity for gold than normal tissue

CONCLUSIONS

- (1) The work of Møllgaard, confirmed by Madsen and Morch, suggests that sanocrysm therapy rests upon a sound experimental basis; judgment must be given upon the results obtained, rather than upon the, as yet, obscure mechanism of their attainment
- (2) Clinically, the dosage must be adjusted to the individual; the goal to be achieved is a very slight reaction
- (3) If this is done, the criticism that sanocrysin is a dangerous drug, is invalidated
- (4) The mode of its action seems, in part at least, to be specific, and to consist of a tissue stimulation.
- (5) The results of its clinical use are more than encouraging In certain cases of the utmost gravity surprising successes are claimed, in others the rate of improvement—either spontaneous or the outcome of more conservative measures—is greatly accelerated
- (6) From our material, cases of recent exudative disease, especially in young adults, yield the best results

bacteriolysis, and that of metallic intoxication are alike untenable. Can an alternative be supplied? The first question to be decided is whether sanocrysin exerts its undoubted effects specifically-in the chemotherapeutic sense—or non-specifically, in that it produces a "shock" of therapeutic potency, similar to that induced by an injection of foreign protein That real specificity exists is suggested by the production in many cases of a focal reaction; Møllgaard, Madsen and Morch, testify to its occurrence experimentally, especially in those animals which die of "sanocrysin-shock" Murray Lyon has seen it in cases of tuberculous adenitis and lupus; in four of our cases "tightness" in the chest dyspnæa, increased cough, and an exaggerated moistness of the pre-existing physical signs, following an injection, were evidence of its production Assuming this specificity, what is the channel of its action? Broadly viewing the sanocrysin treatment of pulmonary tubercle, two facts stand out-one is that in a fair proportion of cases (40 per cent of ours) the sputum is cleared of tubercle bacilli, for significant periods, if not permanently, the other is that sanocrysm is a stimulant to fibrosis, as is shown by the experimental work of Madsen and Morch, and clinically factor in the pathology of tubercle, by which these two phenomena may be correlated? Aschoff (quoting the work of Goldmann, Kıyono, and Evans) has stated that the characteristic cells of a tubercle are of reticulo-endothelial parentage; these cells have, amongst others, two important properties—they are phagocytic, and also the precursors (fixed histocytes) of fibrous tissue Can it be that sanocrysin is a specific stimulant to these cells? That on the one hand by increasing their phagocytic powers it causes the disappearance of organisms from the sputum,

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permanent In cases of chronic pulmonary suppuration it is a valuable procedure combined with other surgical measures—(Archives of Surgery, Vol. 20, No. 2, February, 1930, p. 175)

The Treatment of Gastric Ulcer with Insulin

A. Cade and P. Barral record the treatment with insulin of a series of 25 cases presenting the symptoms of gastric or duodenal ulcer. Their experience is that a considerable proportion of the cases showed a rapid improvement in their symptoms, especially as regards the disappearance of pain, though the term cure could hardly be applied, those cases in which there was pyloric stenosis did not benefit. Small doses of insulin were sufficient, 15 units per day, and treatment was continued for 20 to 25 days. No case was any the worse for the treatment—(Gazette des Höpitaux, February 22, 1930, p. 282.)

The Causes of Recurrence of Gastric and Duodenal Ulcers

M. Einhorn insists that recurrent attacks of gastric-duodenal ulcer occur at certain critical periods for each individual ulcer patient There are certain definite seasons, namely, the spring and antumn, during which most of the recurrences of gastroduodenal ulcers occur The largest number of recurrences occur during the months of September and May, a moderate number during March and October, and a minimum percentage during the months of June, July and August There is a rise in recurrences beginning the fourth week in February, including the first week in March, a decline during the fourth week in May until the second week in June, a gradual rise commencing the third week in August until the second week in September, at which period the maximum number is reached Colds are the most important factor, being present in 57 per cent of all recurrences, the mild cold with sneezing and running nose constituted the highest percentage Diet, psychic influences and external pressure are other factors which play an important rôle in the production of recurrences In 25 per cent of the cases there are no definite factors to which the recurrent attacks of gastroduodenal ulcers can be attributed -(American Journal of the Medical Sciences, Vol. CLXXIX, No 695, February, 1930, p 259)

The Effects of Drugs upon the Motor Activity of the Gall-bladder

A. L Bassin and L R Whitaker have carried out a series of experiments on the effects of various drugs on the motor activity of the gall-bladder, and have come to some interesting conclusions By the use of radiopaque medium in the gall-bladder it was found that the smooth muscle stimulants, barium chloride, pituitrin, and lead acetate, produced slight but definite contraction of the

Practical Notes.

Psittacosis and its Incidence

H Kaliebe reports two cases of psittacosis occurring in a family One occurred in a woman of sixty-one who had been in the habit of fondling a recently-imported parrot The parrot died suddenly after one day's illness with loss of appetite and diarrhea days later the owner developed a high temperature with cough, headache and signs of pneumonia in the lower lobe of the right lung Resolution did not take place, and the woman died eight days later of heart failure The brother-in-law of this patient, who had also been in the habit of playing with the parrot, developed a violent headache, worse in the temporal region, with rigors lasting fifteen minutes at a time, a few days after the death of his sister-in-law On the first day of his illness he complained also of a slight "stitch" in his chest and some cough On examination, breath sounds were weak over the lower part of the left lung, and a few vesicular râles were audible over this area. At the right base a few crepitations could be heard The subsequent history of this patient is not mentioned Dr Kaliebe refers to previous epidemics of this rare disorder, and particularly to those in Paris during 1892-1896, and in Cologne in 1908 From a study of these and his own cases he concludes that pattacosis is a highly infective disease, spread by contact with affected parrots The mortality is high, 70 to 80 per cent. The onset may be difficult to distinguish from enteric fever. It may be differentiated from a simple lobar pneumonia once the pulmonary signs appear by the fact that the herpes febrilis, associated with the latter disorder, is almost invariably absent in psittacosis. The incubation period has been given as from 6 to 9 days, but if direct infection only is admitted, the incubation period in one of Dr Kaliebe's cases was 14 days If, however, the disease can be spread from person to person, the incubation period may be much shorter -(Deutsche medizinische Wochenschrift, January 31, 1930, p 179)

Phrenicectomy in the Treatment of Pulmonary Discases

J A Moore states that phrenicectomy (paralysing half the diaphragm by resection of part of the phrenic nerve in the base of the neck) is a procedure of definite value in the surgical treatment of pulmonary diseases. Its widest field of application is in the treatment for predominantly unilateral pulmonary tuberculosis. As a supplement to artificial pneumothorax it definitely enhances the value of this form of treatment, and will change many cases of unsatisfactory collapse into satisfactory ones. Combined with multiple intercostal neurectomy, phrenicectomy offers a chance for cure in a small number of patients in whom pneumothorax or thoracoplasty should not or cannot be done. In bronchiectasis one may occasionally obtain a brilliant cure, but, as a rule, the most that can be expected of the operation is improvement that is not

PRACTICAL NOTES

five have not been heard from for more than two years. The serological reactions, although of interest, are not always of prognostic significance, and an effort to evalure the mental of treatment from the serological reactions alone may be miles in The objective signs of parenchymators remostiles which the result of a destructive process in the remain are many materially influenced by this form of treatment. On the other hand, the more meningeal the degree of the interement the better the results Several patients who showed comour classes signs of paresis, but who were in complete remission for about two years following treatment by malaria, have manifered time of slow but steady mental deterioration. The evidence from this study and a review of the literature indicate that the life experiency of patients with paresis is increased by treatment -ith malaria, even though complete remission does not develop Notwithstanding opinions to the contrary, results of this type are not a contraindication to the method. Treatment by typhoid vaccine may be substituted if treatment by malaria is not possible, although the therapeutic remissions in the authors' experience have been less frequent and less pronounced -(Journal of the American Medical Association, February 15, 1930, p 454)

The Treatment of Enteric Fever in Infants.

M Marian observes that the prognosis of enteric fever in infants is grave, death usually following such complications as bronchopneumonia or a cholera-like diarrheea. Hot baths every three hours are of considerable value in treatment, and one of the following stimulants may be given by hypodermic injection from once to thrice daily

B. Camphor - - - g 0 5 (grs $7\frac{1}{2}$)
Sulphuric ether - - - g 2 (M 30)
Olive oil - - - ad 8 c cm

or the following

B. Caffeine citrate - - - - - g 0 02 (gr 1/3)
Aq destillat - - - - ad 2 c om

The mouth must be frequently washed out with a weak solution of bicarbonate of soda Vaccine treatment is of little value—(Journal des Practiciens, February 15, 1930, p 105)

The Incidence of Nasal Sinusitis in Asthmatic Children

R Chobot declares that the incidence of sinus infection in asthmatic as well as in normal children is much higher than has hitherto been believed. In a series of 100 asthmatic children, 60 per cent were boys and 40 per cent were girls. Fourteen per cent had their first attack in the first year of life and 19 per cent in the second year, which figures compare closely with those of other observers. Fifteen per cent of the patients studied had negative skin reactions. The incidence of the age of onset in this group parallels that in the hypersensitive patients. Fifteen per cent of the sensitive patients had their first attack in the first

viscus Giving olive oil emulsion and egg yolk intravenously produced expulsion of the contents of the gall-bladder more pronounced than with any other substance. Rapid and vigorous but momentary expulsion of the contents of the vesicle was produced with "cholecystokinin" Ergotamine produced slight emptying of the gall-bladder in some of the experiments. Physostigmine not only failed to produce emptying of the viscus but checked the process when once started. Atropine, while it ordinarily inhibited emptying, failed in one case, the gall-bladder emptying completely in spite of it. The gall-bladder could be made to empty by fat feeding while the animals were under barbital and occasionally while under light ether anæsthesia. Calomel and magnesium sulphate administered by stomach tube had no effect, and magnesium sulphate intramuscularly produced only slight activity. Fats, in emulsion, given either by mouth or intravenously, appear to be the most constant and effective means of evacuating the gall-bladder.—(New England Journal of Medicine, Vol. 202, No. 7, February 13, 1930, p. 311.)

The Treatment of Rickets by Irradiated Ergosterol

L Kostyal has observed the results of treatment of many severe cases of rickets by preparations of irradiated ergosterol. At the commencement of treatment the inorganic phosphorus content of the blood plasma was estimated and found to be well below normal. At the end of three weeks the phosphorus content had risen to normal, except in cases complicated by bronchopneumonia or tetany, and there was distinct clinical improvement. The improvement in the general condition of the children accompanied, but did not actually coincide with the rise in the phosphorus content of the blood. The changes in the bones were observed and controlled by X-ray pictures, and it was found that in 5 to 6 weeks complete healing of the rickety changes took place. No deleterious effects were seen at all from administration of ergosterol. L. Kostyal suggests that this preparation might be given to mothers before and after the birth of their children as a prophylactic measure against rickets—(Jahrbuch für Kinderheilkunde, Bd oxxvi, 1930, p. 362.)

The Treatment of Neurosyphilis by Malaria and by Typhoid Vaccine

P A O'Leary and L A Brunsting report that from June, 1924, until April, 1929, they treated 509 patients by malaria. An additional 140 patients were inoculated with Plasmodium vivar, but malaria did not develop. The patients who have shown outstanding results are those with early manifestations of paresis, those with sine paresi, and those with asymptomatic neurosyphilis who failed to show response to intravenous medication. Of the original twenty-four patients treated by malaria and reported on in 1925, ten are still in complete remission, five have not shown improvement or have steadily progressed, four are dead, and

PRACTICAL NOTES

five have not been heard from for more than two years. The serological reactions, although of interest, are not always of prognostic significance, and an effort to evaluate the method of treatment from the serological reactions alone may be misleading The objective signs of parenchymatous neurosyphilis, which are the result of a destructive process in the nervous system, are not materially influenced by this form of treatment. On the other hand, the more meningeal the degree of the involvement the better the results Several patients who showed obvious clinical signs of paresis, but who were in complete remission for about two years following treatment by malaria, have manifested signs of slow but steady mental deterioration. The evidence from this study and a review of the literature indicate that the life expectancy of patients with paresis is increased by treatment with malaria, even though complete remission does not develop Notwithstanding opinions to the contrary, results of this type are not a contraindication to the method Treatment by typhoid vaccine may be substituted if treatment by malaria is not possible, although the therapeutic remissions in the authors' experience have been less frequent and less pronounced -(Journal of the American Medical Association, February 15, 1930, p 454)

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THE PRACTITIONER

Affections of the Eye in General Practice By R Lindsay Rea, BSc, MD, M.CH, FRCS London H K Lewis & Co, Ltd 1930 Price 10s 6d

This book is essentially written with a view to helping the practitioner in the diagnosis and treatment of cases arising in his daily work. It clearly differentiates those cases which need immediate help and assistance from the ophthalmic surgeon from the simpler cases which can be well treated by the general practitioner. The book is well illustrated and includes several coloured plates. It contains a lucid account of the differential diagnosis and treatment of irrits and glaucoma, which, when combined with the practical experience of seeing a few of these cases in hospital, should prevent any mistake being made in their treatment. There is an excellent list of prescriptions at the end, together with a good index. This book should be in the hands of every general practitioner.

Notes on the Medical Treatment of Disease for Students and Young Practitioners of Medicine By Robert Dawson Rudolf, CBE, MD, FRCP, Professor of Therapeutics in the University of Toronto University of Toronto Press 1930 (Med. 8vo, pp 516) Price 4 dollars

The first edition of this wise and practical work appeared in 1921, and the present edition, which has been thoroughly revised, is very little larger than the second edition in 1923. The insulin treatment of diabetes mellitus can now be more definitely regarded as a sure success than at the time of the last edition, and it is pointed out that the partial rest thus given to the islands of Langerhams is sometimes followed by increased secretion of insulin, so that its administration may be lessened or even discontinued, and the patient may be able to do well on a carefully regulated diet. The other great advance in recent years, the treatment of pernicious anæmia brought forward by Minot and Murphy his duly indiced, and the benefit obtained by some asthmatic patients from X-ray exposures is tentatively explained by the foduction of protein shock. The common-sense character of the work is well shown in the sections on venesection and raised blood-pressure, and attention is drawn to the long period of a lower blood-pressure that may follow bleeding in toxic hyperpiesis.

Obstetrics and Gynecology, Vol xix, No 1, January, 1930, p 102)

Coxa Vara.

A Tréves insists that there are several varieties of coxa vara, and the two principal ones are a coxa vara of adolescents, similar to genuvalgum and often to unilateral tarsalgia, and a progressive bilatera coxa vara consecutive to real pathological fractures. In an evolutive lesion, the author performs the straightening in one stage or by degrees in a recalcified neck, he is satisfied with the results obtained by subtrochanterian osteotomy—(Bulletins ct Mémoires de la Société des Chirurgiens de Paris Vol XXII, No 2, January 24, 1930, p. 67)

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NIGHT OR MORNING? WHEN TO TAKE LAXATIVES

There can, of course, be no universal rule as to the taking Circumstances of laxatives vary, and only the physician is in a position to judge their relevance But experience seems to show that a good deal of harm is often done by the common habit, continued over long periods, of taking aperients at bed-time night, the colon is normally much less active than in the day, and it seems unwise, unless special reasons exist, to stir it to unwonted activity during the hours which should be allotted

a tendency When there is even to slight constipation, not fully remedied by diet and exercise, it is suggested that the most satisfactory result can generally be obtained by taking, first thing in the morning, on an empty stomach, a simple refreshing saline draught, such as Eno's "Fruit Salt" provides Eno is a saline effervescent of fine granular consistency, containing trace of irritating salts, such as Epsom Glauber Owing to its purity

Testicular Grafting from Ape to Man By Serge Voronoff and George Alexandrescu, translated by Theodore C Merring, M.D. London Brentano's Limited 1929 (Pp xii and 1931) illustrations 39) Price 3s 6d

This well-illustrated volume deals with the operative technique. the physiological manifestations, the histological changes which occur in the graft until it undergoes fibrosis in about four years, the correlation between these changes and the physiological phenomena, and statistics of the operative results. A detailed description is given of the elaborate precautions necessary to secure satisfactory. union of the thin shees of the ape's testis with the outer surface of the tunica vaginalis testis of the man, the stages of the surgical procedure being shown in a series of illustrations For a few days after the operation there is commonly transient psychical and sexual excitement, this is followed by a disappointing absence of any beneficial effect for two or three months Then well-marked improvement begins, especially "in physicians and other individuals who are highly developed intellectually" The beneficial effects include sexual activity, increased basal metabolic rate, diminution in subcutaneous fat, growth of hair, relief of prostatic symptoms, better memory and increased muscular power, but they completely disappear after five or six years The operation was repeated after five or six years in 42 cases with success in 91 per cent The statistical summary of 475 cases of amuan testicular grafting upon men per-

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The TB Patient's Guide By Frederick J C Blackmore, MRCS, LRCP, Tuberculosis Officer, Metropolitan Borough of Woolwich, President of the Tuberculosis Group, Society of Medical Officers of Health London Cassell & Co (Pp 76) Price 1s 6d

This useful little book is written in simple language and explains the difficulties and pitfalls which he in the way of the ordinary man or woman during the uphill climb to recovery from tuberoulosis. It explains how the disease begins, what steps to take when the symptoms appear, and how to obtain the benefits of sanatorium treatment even when, as so often happens, financial difficulties or domestic circumstances stand in the way

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- ADAMSON, OSWALD J: W, MR C.S., L.R C P, appointed Honorary Clinical Assistant to the Sussex Eye Hospital
- BARROWMAN, THOMAS, MB, Ch B Glasg, appointed Fourth Resident Assistant Medical Officer, Booth Hall Infirmary, Blackley, Manchester
- BEATTIE, NEILR., M D., B S., B Hy, D P H Durh, appointed Medical Officer, Ministry of Health
- BLACKWOOD, MARGARET, MB, Ch B Glasg, DPH Liverp, appointed Assistant Medical Officer of Health, Barnsley
- BROCKMAN, E P, M Chir Camb, FR C.B.Eng., appointed Surgeon in Charge of Orthopædic Department, St John's Hospital, Lewisham
- CHANDLEH, F. G., M.D. Camb, F.R.C.P. Lond., appointed Assistant Physician to St. Bartholomew's Hospital.
- OHARLES, H., L. R.C.P Lond, M. R.C.S., appointed Anasthetist, City of London Maternity Hospital
- CROCKATT, R E., M B., Ch B Leeds, appointed Certifying Factory Surgeon for the Sutton Bridge District, Co Lincoln.
- DRIVER, G. P., M.R.C.B., L.R.C.P., appointed Certilying Factory Surgeon for the Bullth District, Co. Brecknock,
- GIBBENS, J. H., M.A., M.R. C. P.Lond., M.R. C. S., appointed Physician in Charge of the Children's Department, St. John's Hospital, Lewisham.
- HARDIE, DAVID, M.C. M.B., Oh.B., F.R.C.S. Edin, D.O. Oxon., D.O. M. S.Lond, appointed Homorary Assistant Ophthalmic Surgeon, Royal Victoria and West Hants Hospital, Bournemouth
- HILTON, M J, MB, BS Durh, appointed Certifying Factory Surgeon for the Camberwell District (London)
- LODGE, R., MB., FRG.S.Edin, appointed Honorary Assistant Surgeon to Lelcester Royal Infirmary
- LOGAN, J S., MB., Ch B Liverp., appointed Deputy Medical Officer of Health for Swindon.
- LOVE, R. J Mon., M S Lond., F R C.S., Eng., appointed Consulting Surgeon, City of London Maternity Hospital.
- MORTON, JEAN HALL, MB, ChB St. And, DPH Camb, appointed Assistant Medical Officer, Maternity and Child Welfare, Birmingham.

- NEWSOM, S, MB., ChB, FRC.8 Edin, appointed Honorary Orthopædic Surgeon to the Kidderminster and District General Hospital.
- NICHOLSON, RUTH, MB, MS Duneim, appointed Homorary Surgeon, Liverpool Maternity Hospital.
- O'DONNELL, G. P., MB, BCh, BAO., NUL., appointed Certifying Factory Surgeon for the Redruth District (Cornwall)
- PEARCE, C M, M.B, BS Lond, FRCS Eng., appointed Honorary Assistant Surgeon to the Blackburn and East Lancashire Royal Infirmary
- PINTO-LEITE, H., LRC.P Lond., MRCS., appointed Medical Superinten dent to the Hospital of SS John and Elizabeth, Grove End Road, NW
- REID, M B, Ch B Aberd, appointed Honorary Assistant Surgeon, Essex County Hospital, Colchester
- RICHARDS, H. A., L. R.C.P. Lond, M. R.C. 5., appointed Annethetist, City of London Maternity Hospital
- ROBERTSON, I M, MB, Ch B.Edin., appointed Certifying Factory Surgeon for the Cupar District, Co Fife.
- SAVIN, L. H., M.B., B.S. Lond., F.R.C.S.Eng., appointed Ophthalmic Surgeon to the Metropolitan Hospital
- SEMPLE, A., MB., Ch.B.Glasg., DPH., appointed Medical Officer of Health Carlisle
- SMITH-OWEN, E R, MB, Ch B
 Liverp., appointed Certifying Factory
 Surgeon for the Uxbridge District, Co
 Middlesex
- STIRLING, T S., M B., Ch B Glasg, DP H Camb., appointed Assistant County Medical Officer of Health for Somerset
- WHITROW, FLORENCE, MB, ChB Manch., appointed Third Resident Assistant Medical Officer Booth Hall Infirmary, Blackley, Manchester
- WIRTH, M D, Malta, appointed Honorary Surgeon, Essex County Hospital Colchester
- YEO K J., MB. BChir Camb, DMRE, appointed Physician in Charge of the Yay Department, St John a Hospital, Lewitham

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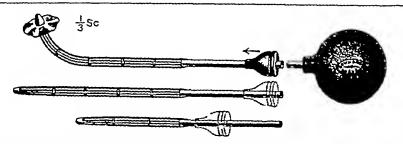
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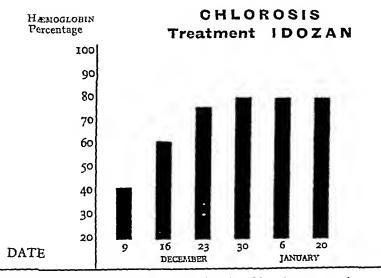
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In order to encourage the writing of original articles by jumor practitioners, The Practitioner offers a prize of 50 guineas for the best article written by a medical practitioner who has been qualified for not more than two years by December 31st, 1929. A second prize of 10 guineas, and a third prize of 5 guineas are offered under the same conditions. Articles must not be less than 500 or more than 2,500 words long, and may be illustrated, though this is not essential. Articles may deal with any branch of medicine, including surgery, midwifery, pathology, physiology, public health, etc. Articles dealing with clinical subjects should include case-notes of not more than three cases personally observed by the author.

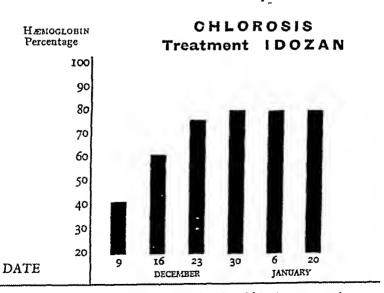
Articles intended to compete for this prize must be sent before July 1st, 1930, to The Editor, The Practitioner, 6-8, Bouverie Street, London, EC4 They should be signed by a pseudonym, and accompanied by a sealed envelope containing the author's full name, address, qualifications, and hospital appointment, if any

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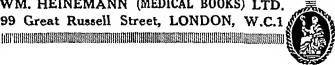
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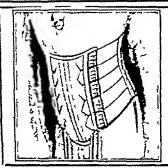
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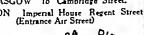
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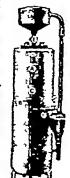
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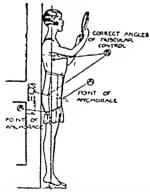
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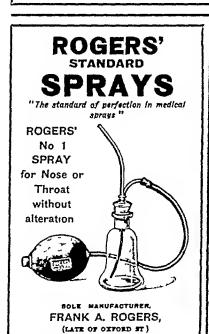
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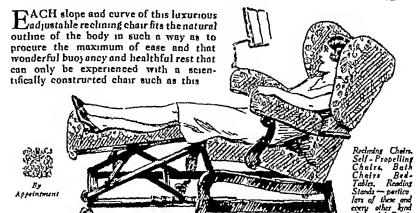
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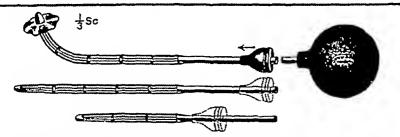
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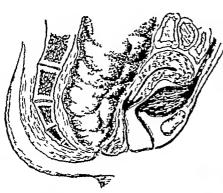
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Salivarius, Barnes 445	Mouth Tonsillitis	1-100
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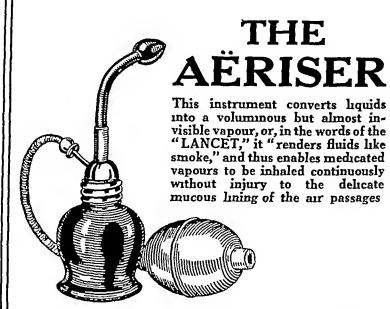
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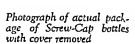


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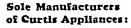




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MAY 1930

The Treatment of Fractures of the Mandible.

By PERCIVAL P COLE, MB, FRCS
Surgeon to Queen Mary's Hospital, the Seamen's Hospital,
Greenwich, and to the Cancer Hospital

AND

CHARLES H BUBB, OBE, MRCS, LRCP, LDS

Late Hon Dental Surgeon to King George's Hospital

With remarks on Anæsthesia by STANLEY E ROWBOTHAM,

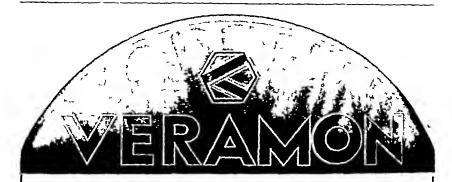
MRCS, LRCP

Anæsthetist to the Seamen's Hospital, Greenwich, to the Cancer Hospital and to the Royal Free Hospital

HE fractures to be dealt with in the following article are those due to injury; pathological fractures will not be considered

Joint authorship of a communication dealing with fractures of the mandible indicates our consistent attitude towards the treatment itself In the early months of 1916 we were urging and practising collaboration and co-operation of dental surgeon and surgeon in the treatment of these injuries determined during the war. At that time we were initiating a maxillo-facial department on lines that were afterwards recognized as being essential to success, and were widely adopted throughout the country lessons learnt during the Great War are in danger of being forgotten, however, and we therefore take this opportunity of restating our conviction that haison in the treatment not only of mandibular injuries, but in the treatment of various types of diseased conditions

489



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it supersedes, or at least defers, the use of morphine.

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TREATMENT OF FRACTURES

appliance

The only fractures, then, which are suitable for treatment by a simple mechanical appliance, such as a jaw bandage, are those affecting the ascending ramus not communicating with the mouth, and in which either no deformity is present or in which the deformity present can be reduced and correct alignment maintained by the means indicated. Many forms of jaw bandage are available, and the one most commonly in use and mentioned in text-books is the ordinary four-tail bandage. This particular bandage has the advantage of being easily available, and can be used until a bandage of a better type can be obtained. The type of bandage, or jaw support, which has proved of service is illustrated in Fig. 1. A modification of it



Fig 1:

embodying a knitted chin-piece and elastic traction was devised and used by us at the King George Hospital, but the superiority over the ordinary four-tail is the transmission of a direct upward pull as opposed to some degree of backward traction. In cases in which fractures occur in the region of the condyle, it will usually be found that reduction of deformity is difficult, and maintenance of alignment cannot be maintained

affecting jaws and face is of fundamental importance to the best interests of the patient, and to the attainment of improved results The attitude of the general surgeon towards these conditions was criticized recently in a paper read in the Odontological Section of the Royal Society of Medicine by Mr Kelsey Fry, but it may be doubted whether the dental surgeon is not at times equally to blame in that he omits to enlist the services of the surgeon when surgical measures, as opposed to purely orthodontic procedures, are indicated by the nature of the case. It is true that mutual trust and confidence are essential, but these will be automatically developed by constant contact, and the pooling of knowledge and effort thereby determined cannot but make for progress and efficiency not our purpose to deal in detail with technical mechanics, but to outline broadly the lines of treatment which we have found successful, and which have become in our hands practically stereotyped

From the mechanical standpoint certain characters indicate the need for internal splinting with a view to immobilization and correction of deformity, whereas in others the aid of splints can be dispensed with and replaced by some form of law bandage which will determine a sufficient degree of immobilization to permit of speedy and effective union We insist that the fundamental factor concerned in this differentiation is the nature of the fracture and not the question of displacement. In other words, we are of opinion that every fracture communicating with the mouth cavity must be immobilized by some form of internal splint, no matter whether displacement is present or not. Our reasons for this dogmatic conclusion are that it is impossible to guarantee that septic infection, leading to necrosis and loss of bone, will not occur unless a degree of immobilization is obtained far greater than can be procured by any form of external

neglect on the surgeon's part to procure accurate alignment We maintain decisively that the correct relationship of the lower to the upper teeth should be restored in all cases in which this can be accurately gauged, and in other cases, the surgeon should align the fragments with a view to the preservation of function, contour and symmetry In civil life, loss of bone very rarely occurs as a direct result of the injury sustained, but should this be so, we are of opinion that occlusion should not be sacrificed to considerations of expediency We deprecate now, as we did in 1916, pusillanimous surrender to the policy of union at any Bone-grafting of the mandible has proved itself so safe and reliable that it has come to be regarded as a routine procedure, and not one to be eliminated from the schedule of treatment

To deal now with concrete cases, the simplest type of fracture is a single one involving the body of the jaw with a sufficient number of teeth on either side of the fracture to allow accurate estimation of occlusion and to afford adequate hold for a simple interdental splint

Splints may be grouped, for purposes of discussion, into two classes —

- (1) Interdental or mandibular
- (2) Maxillo-mandibular

The use of interdental wiring, that is, wires connecting the teeth of the lower to those of the upper jaw, has been advocated by some authorities as a permanent method of reducing deformity and maintaining alignment. The disadvantages of this method are obvious, and we ourselves only adopt it as a temporary measure pending the adaptation of more comfortable and hygienic apparatus. Wherever possible, splinting should be hmited to the lower jaw itself, and in the relatively simple fractures which form a large proportion of those met with in civil life, this ideal can be attained.

without the adaptation of some internal splint. A fracture of the coronoid process, frequently associated with injuries of this type, does occasionally occur alone, in which case mal-occlusion does not result, and internal splinting is not necessary. An example indicating the untoward results that neglect to splint may produce is as follows—

A C, a man 34 years of age, came under the care of a dental surgeon in October, 1927. One day prior to admission he fell, striking his jaw on an iron bar, and a fracture was thereby produced involving the socket of the last molar tooth. The tooth was extracted, and he was treated in an expectant fashion, the socket being syringed and ordinary attention paid to the hygiene of the mouth, but no splint was fixed. In the second week of December suppuration still continued, and a large sequestrum in the neighbourhood of the fracture became loose, and was removed. Three other small sequestra separated, and were removed during the next six weeks. At this stage splinting was decided upon, but no union occurred, and, finally, the condition of non-union had to be remedied by a pedicle graft operation, nearly a year after the original injury. Firm union has now been determined, dentures have been adapted, and his powers of mastication have been restored to normal

In the communication previously referred to, Mr Kelsey Fry cited numerous cases of necrosis and loss of bone, associated with non-union, which had come under his care after a condition of non-union had been clearly established, and on being questioned as to the cause, he admitted that failure to immobilize had been responsible

The objective in all cases of fractured mandible in whatever site they occur is to determine union with no deformity, that is, restoration of the normal bite or occlusion. The necessity or even ability to restore the bite depends clearly on the number of teeth present and their disposition. A certain degree of adjustment can be determined by the patient who is able to some extent to learn to correct defects in occlusion. This capacity is difficult to assess, and, in any case, it is our opinion that the patient should not be called upon to remedy functional depreciation arising from a

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Impressions of upper and lower jaws are taken as soon as our assistance is invoked Should the patient's condition render an anæsthetic necessary. we unhesitatingly advise it, and the presence of swelling, traumatic trismus or other apparently untoward con-

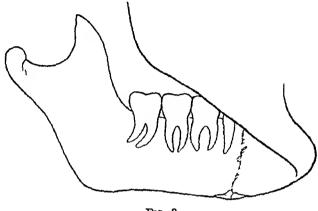


Fig 2

ditions do not deter us. The impressions are taken with ordinary modelling compound, but it is essential that good ones should be obtained, that the necks of the teeth should be clearly defined, and that dragging should be climinated as far as possible, for clearly the fit of the splint will depend upon the success or otherwise of this initial measure and the fit of the splint is a factor that cannot be too emphatically stressed When an anæsthetic is necessary, it is always administered by the nasal intratracheal route The type of splint universally adopted has been the cast metal cap, and the metal used has been either aluminium or standard silver, preferably gilded In connection with splint adaptation arises the question of the extraction of teeth in and neighbouring the line of fracture, and here we adopt no hard and fast rule of action

We are guided in this matter by consideration of the value of the teeth concerned, either in providing a hold for the splint whereby correct alignment can be

Consideration of internal splinting raises the question when this procedure should be put into effect. There cannot be any hesitation in saying that it should be done at the earliest possible moment. Some allege that a waiting policy should be adopted until the swelling, pain and sepsis have yielded as a result of local treatment other than splinting. We regard this waiting policy as fundamentally wrong, for diminution of swelling, relief of pain and discomfort and control of sepsis can be determined more surely and more quickly by early splinting than by any other measures

A further disadvantage of neglect or mability to institute early treatment is that changes occur in the soft parts which render reduction difficult to effect, and impossible to maintain without assistance either in the way of loosening the fragments or by some method of constant traction. It is surprising how quickly, particularly in double fractures, this resistance to reduction can assert itself

FO, a boy aged 15, was knocked down in a bicycle accident on October 5, 1928. He was rendered unconscious, and his general condition was such that no treatment for his jaw condition could be attempted for eight days. On the 13th of the month impressions were taken without an anæsthetic, and on the 18th splints were ready for insertion. With great difficulty reduction was effected under an anæsthetic, but the tendency to displacement was so great that the splints became loosened and had to be refixed, a second anæsthetic being necessary for this purpose

In another case (referred to us by Dr Gardner, of Weybridge), that of a Mr G, a young man who crashed in a motor cycle race at Brooklands, treatment could not be started until three weeks after his injury, as he was severely concussed and lay unconscious for seventeen days. In this case, surgical intervention was necessary to release the fragments at the site of fracture and so allow adaptation of splints so arranged as to effect complete reduction in a mouth containing a full complement of teeth

The line drawing (Fig. 2) shows the condition three and a-half years after the injury

It is scarcely necessary to insist that every case should be X-rayed and a stereoscopic view is of considerable value. This being done, our procedure is as

canine. "By careful and constant irrigation, and early fixation of the fragments, we were able to obtain union in two or three weeks without sacrificing the canine, which ultimately erupted in normal position. Another case was a youth, aged 16, where the line of fracture was in close relation with the left lateral incisor. Here, again, early and persistent irrigation in a strong healthy patient prevented irreparable damage to the periodontal membrane."

Before passing on to the consideration of maxillomandibular splints we would refer to the method of fixation by circumferential wires, which has been extensively used by us in cases in which teeth in the lower jaw have afforded inadequate hold, in edentulous lower jaws, and in cases in which the tendency to displacement has been so great that we feared that cement fixation might be insufficient. The procedure is as follows. A small punctured incision is made through the soft parts, over and down to the lower border of the jaw in front of the facial vessels Through this incision a suitable wire carrier is inserted and passed up along the inner surface of the jaw to emerge through the mucous membrane of the mouth. A piece of stout silver wire is inserted into the hollow canula and the instrument withdrawn carrying the end of the wire out to the skin surface. The wire carrier is then inserted through the mucous membrane of the buccal sulcus, passed down in contact with the outer surface of the jaw to emerge through the skin incision. The end of the wire emerging at the same place is then bent, and inserted into the wire carrier, which is then withdrawn carrying the end of the wire into the mouth. The wire is then cut in such a way as to leave a sufficient length to be twisted over the splint which has been suitably notched for its reception. The twisted ends are then turned down and, if necessary, covered with a small piece of capillary rubber tubing to

maintained, or where, as in the case of incisors, retention if possible is indicated for cosmetic reasons

A striking example of the extent to which conservatism can be carried was afforded in the case of Miss D This patient was injured in a motor accident on Kingston Hill on November 25, 1924 had sustained a fracture in the molar region at the right side and a horizontal fracture of the alveolus in the incisor region of such a nature that the teeth involved were projecting through a ragged wound just below the margin of her lower lip. The posterior fragment on the right side contained a molar tooth which was preserved to allow this fragment to be controlled and the incisor teeth with surrounding alveolus were gently replaced and covered by the splint which was cemented in position. We were very apprehensive as to the possibility of preserving these teeth, but our fears were Firm union occurred between the alveolus and the body of the jaw and the teeth when the splints were removed were firmly placed in their normal position. This patient sustained at the same time fractures of both bones of the right forearm, which were dealt with by plating Her jaw, however, was firmly united and normal mastication was possible long before the forearm was restored to normal function

We are aware that traditional teaching holds that loose teeth, and particularly those involved in the line of fracture, should be extracted as a routine measure. It is curious, however, that the most ardent advocates of this course depart from this practice in what they call exceptional cases, and their dogmatic statements cannot but be weakened if success, as they admit, is attained on occasions when departure from their rule results favourably. We would quote in this respect the admissions made by Mr. Kelsey Fry in the paper previously referred to, and by Mr. Lewin Payne in a lecture delivered at Guy's Hospital last year.

Mr Kelsey Fry advocates the retention of the tooth in the posterior fragment, "which at first examination would require removal. But it must be remembered that it is extremely important to have a molar tooth left for splinting purposes, and the benefit of retaining it even for a time outweighs the septic risks of keeping it."

Mr Lewin Payne instances the case of a boy in whom the fracture passed along the direction of an unerupted

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Section of the Royal Society of Medicine in January of this year, referred to a bone-graft in a child aged 7, alleging that this was a record, in so far as the age of

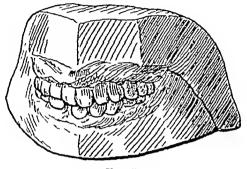


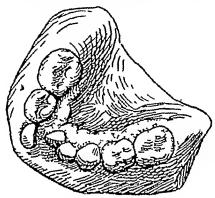
Fig 5

the patient was concerned. My own case, as will be seen, was much younger than that quoted by him and does, I think, establish a record for this type of lesion

In cases not suitable for simple methods such as the interdental splint, or immobilization by some form of jaw bandage, splints of the maxillo-mandibular type must be employed The fundamental reason for the use of the double splint is to permit of the lower jaw fragments being assembled and aligned in terms of the fixed upper jaw, the occlusion with which can usually be determined with complete accuracy As is indicated by the foregoing statement of the objects to be attained, upper and lower jaw must be splinted separately, the lower jaw being corrected as far as possible in terms of itself before being adapted as a whole in terms of the upper jaw Occasionally, the splints for the lower law are made in two parts, and alignment of the lower jaw teeth is then determined when the two separate parts are fixed correctly to the upper jaw splint It is particularly in double fractures that this method presents definite advantages. But whether the lower jaw be splinted in one

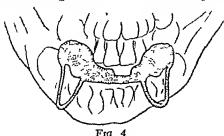
prevent any possibility of painful friction against the soft tissues of the lips or cheek. An example illustrating the advantages of this method may be given here.—

LB, a little girl aged 4 years, fell on to her chin and sustained a fracture in the neighbourhood of the symphysis. She was admitted to hospital, where an attempt to wire the fragments into position was inadvisedly undertaken. As so often happens, the wire became loose, suppuration and necrosis occurred, and the child was admitted under my care at the Seamen's Hospital with an ununited fracture, and the lower jaw deformed, as is shown in Fig. 3. The dental



Fro 3

surgeon to the hospital, Mr Bramley Ball, made for her a cast cap splint and assisted by me reduced the deformity, but two attempts to maintain the splint in position by cement were unsuccessful because the teeth were so shallow that loosening of the splint occurred within a few hours after fixation. We decided to adopt the method of circumferential wiring as the only means of maintaining correct alignment. A line drawing from an X-ray

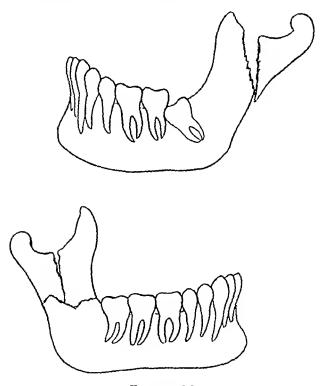


photograph shows the wiring in position (Fig 4) It was hoped that a freshening of the fragments in such a young person might lead to bony union, but we were disappointed Later, however, bone grafting by the osteo-periosteal method was undertaken and firm union was obtained, the occlusion being as shown in Fig 5

Mr. Billington, in a paper read to the Odontological

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way of mucous or, possibly, vomited material after administration of the anæsthetic. The use of this open bite position has been advocated by us for many years, and we have never found the objections to it valid in our practice. In fact, it presents such overwhelming advantages to operator and patient ahke that we utilize this position as a routine procedure. It is true that unless precautions are taken to obviate such a possibility, the bite when the splints are removed may be found to be permanently open, that is, the teeth in the molar region come into contact first, determining abnormal separation of the incisors. This

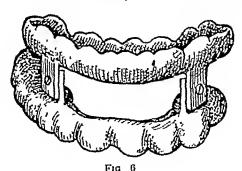


Figs 7 and 8

defect can be remedied by grinding down the occlusal surfaces of the opposing teeth, but this step should 501

or two parts, the fundamental procedure is the same.

The splints adapted for the lower and upper jaws are fixed in position separately with a rapidly-setting cement and thereafter the splints themselves are united in such a way as to determine complete reduction of the fracture and accurate alignment of the teeth The splints may be united at the same sitting; at a later date with a view to allowing complete consolidation of the cement, or may be gradually brought into proper position by the adoption of traction methods We regard traction methods as clumsy and laborious and have always urged and practised immediate reduction, even if surgical intervention is necessary to give this effect. Dealing with the relative ments of immediate and gradual reduction, the dental surgeon (C H. B) maintains now, as he did in 1918 "I have never yet had to resort to any form of orthodontic appliance, surgical treatment achieving in half an hour results that orthodontic treatment would take weeks-in some cases, months-to accomplish"



The type of maxillo-mandibular splint used by us in practically all cases is shown in Fig. 6. The holes in the flanges are threaded and the splints united by screws. It will be seen that a definite interval exists between the upper and the lower splint allowing direct access to the mouth and so permitting entry thereto in the way of food and fluids and exit therefrom in the

present at the sites of fracture some two years after the mjury are indicated in Figs 9 and 10

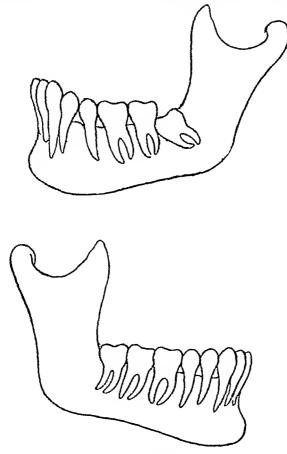
Another fracture which separated the condyle itself was occasioned in rather a curious way. Captain W, who was referred to us by Dr. Beckett-Overy, had been exercising himself on a pogo stick. The spring jambed, and immediately after he had stepped off the stick to ascertain the reason, the spring released itself and the stick struck him in the jaw. He was seen by us within 24 hours, and by that time considerable swelling had occurred with a degree of deformity which, if allowed to persist, would have considerably affected his masticating capacity and his appearance, and he was quite unable to open his mouth. The condyle was found to he inside the ascending ramus and there appeared to be a fissured fracture of the coronoid process without displacement.

In these cases it seems to us a mere matter of ordinary surgical sense to utilize the open bite position, for by so doing, one gives effect to that postulate of surgical mechanics which insists that that position shall be retained, the attainment of which will be threatened should muscular shortening or cicatricial contraction supervene as the result of damage to the soft tissues associated with the bony injury. The splints are retained for a period which varies with the individual case, but we see no necessity to hasten their release, and the condition of the union can always be tested by removing the screws, and so releasing the uniting We find that, for practical purposes, splints are retained from three to five weeks treatment consists of frequent irrigation in the earlier stages and until the patient is able to rinse his mouth in the ordinary way and to use a soft toothbrush to keep the surface of the splint clean and free from food particles which may tend to cling at the junction line of splint and gum The fluid used seems to us to matter little, but in the earlier stages the lotio sodu chlorinati or eusol or chloramine-T may be used with benefit

Plating or wiring should never be resorted to in fractures communicating with the mouth. In other situations such procedures are not necessary as a means of immediate treatment. In suitable cases

never be necessary and is indicative of bad mechanics. We utilize this position even in fractures of the condyle, and we are able to produce line drawings of a double condylar fracture so dealt with. Figs 7 and 8 show the condition immediately after the injury.

This injury was sustained in a motor accident in the case of a young girl, Miss B, whose chin came into forcible contact with the steering wheel of her car. She was referred to us from Oxford with an X-ray photograph showing the fracture in the neighbourhood of the left condyle. A fracture on the right side had not been suspected, but a further investigation showed that a fracture had been sustained as indicated in Fig. 8. This young woman had a full complement



Figs 9 and 10

of perfectly healthy and regular teeth, and as the result of our intervention her bite was restored to normal and the conditions

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ways by turning the stylet, its end may be raised by pushing home, and lowered and advanced by slightly withdrawing the stylet, as illustrated in the diagram. In this way the tube is manipulated into position and passed through the glottles.

The tube may be connected with a small bag for the administration of gas and oxygen, or, ether or chloroform vapour may be given by substituting the alternative fitting shown in Fig. 11(J)

By this method the trachea is virtually extended to the external nares, and an extremely quiet anæsthesia results. It is impossible for the operator to obstruct the airway, and his manipulations may be carried out without causing anxiety to the anæsthetist, or harm to the patient

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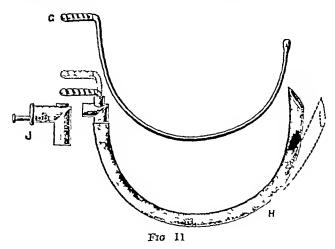
Cole, P. P., and Bubb, C. H., Brit. Med. Journ, 1916, 1, 268-271 Bubb, C. H., Brit. Dent. Journ., 1916, xxxvn, War Suppl., 370-376 Idem. Proc. Roy. Soc. Med., 1918, x1 (Section Odont.), 27-37 Idem. Dent. Sc., 1918, 1x1, 327-335 Cole, P. P., and Bubb, C. H., Brit. Med. Journ., 1919, 1, 67-70 Fry, W. Kelsey, Proc. Roy. Soc. Med., March, 1929, p. 663

they can, however, be utilized with the same precautions as are observed in bone-grafting—together they represent the methods available for dealing with nonumon, an untoward happening outside the scope of this article

REMARKS ON ANÆSTHESIA.

A general anæsthetic may be necessary for fixing the splint. The anæsthesia must be sufficiently deep to overcome spasm of the jaw museles and allow easy manipulation of the fragments. Also, it is necessary that the anæsthetist shall not impede the operator

The only method which will satisfy these requirements is intratracheal anæsthesia, and the type which we advocate is that of laryngeal intubation with a tube sufficiently large for the patient to breathe easily to and fro through it. This tube (which is made of specially thin-walled rubber in several sizes) is passed through one side of the nose. The end is viewed in the pharynx by means of a direct laryngoscope passed through the mouth, and it is controlled by a curved



stylet which runs through a hole in the metal fitting at its distal end The tube may thus be moved side-

"Yes" Professor Hey Groves has recently investigated the reports of cases in which legal action has been threatened, or actually taken, for alleged malpractice in the treatment of fractures and he found that in no less than 90 per cent of the cases it was based on the absence of X-ray examination. It is no use saying, "I know there is a fracture, I do not need an X-ray," for Hey Groves found that in about 33 per cent of cases a correct diagnosis of the main fracture had been made but legal action was taken because the doctor had not taken an X-ray which would have shown malunion, some complication of bone or joint; or would have served to refute the allegations made by another practitioner.

That brings us to another important point, the need for X-raying after the fracture has been set. This is of great legal importance, a proof is necessary to show that the fracture has been set in a good position From the purely therapeutic aspect I believe that it is more important to X-ray after than before setting a fracture It is generally easy to diagnose a fracture without an X-ray, frequently it is impossible to be certain, without an X-ray, that you have obtained efficient reduction Undoubtedly the correct procedure is . X-ray, reduce, re-X-ray, and if the X-ray does not show that you have obtained a good reduction, then you must keep on re-X-raying and reducing till all is satisfactory. The best of all ways is to set the fracture under the X-ray screen, but that is a counsel of perfection seldom possible of fulfilment in general practice

Always insist on having the injured part X-rayed in two planes at right angles to one another. Often, for example, a Colles' or a Pott's fracture looks quite normal in the antero-posterior view though the fracture is immediately obvious in the lateral view.

If there is any doubt whether the X-ray shows a fracture or not, take an X-ray of the corresponding part

The Treatment of Fractures of the Upper Limb in General Practice.

By J BAGOT OLDHAM, FRCS

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HE theory of the treatment of fractures is a dull and somewhat uninteresting theme, its practice is, all too often, an onerous, worrying, ungrateful task, for no one is more troubled by the menace of ungrateful patients and unmerited litigation than the surgeon who treats fractures and dislocations Nowadays, the great majority of fractures are treated in hospitals, but a large number are, and must always be, treated by the general practitioner. To transfer every patient to the specialist would be foolish, to transfer none would be equally illogical. Some fractures, no matter how they are treated, will seldom "let you down", while others, in spite of meticulous care, will be a constant source of worry and a disappointment

When a practitioner meets with a case of fracture one of the questions he asks himself is. "Should I treat this myself or should I send it to a specialist?" He refers, perhaps, to his surgery textbooks and generally he is no nearer the answer to his question. It would therefore seem worth while to consider the kinds of fracture that cause difficulty, and what is the best way to overcome these difficulties and so achieve safety for the patient and security for the doctor.

ient and security for the doctor.

IS AN X-RAY NECESSARY?

The answer to this question is an unhesitating 506

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as it is The surgeon who has plaster of Paris, a set of plain aluminium splints, such as Sir Robert Jones recommends, and a Thomas knee splint, can treat almost any fracture, and treat it well

HOW LONG SHOULD THE SPLINTS BE KEPT ON?

The common mistake is to leave splints on too long No hard and fast rules can be made, but, as a general rule, fractures of the upper limb require fixation for about three weeks, and fractures of the lower limb for six to eight weeks, and, after that, some means must be provided to prevent the limb bowing under the weight of the body. The more perfect the reduction, the less the tendency to the formation of empling adhesions, and the need for physio-therapy. The worse the position, the sooner the splints must come off and massage and movements be started. It is especially necessary to remember this in dealing with aged patients whom we dare not submit to the single or repeated anæsthetics that may be needed to obtain perfect anatomical re-alignment.

HOW TIGHT SHOULD THE SPLINTS BE FIXED ?

Never fix splints on tightly After the splints and bandages have been fixed, there should still be some spring left on pressing the splints together (Fig. 1)

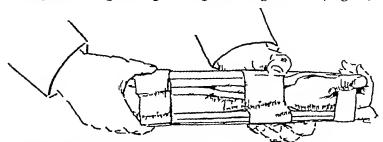


Fig. 1—Notice the wrinkling of the strapping on pressing the splints together illustrating the fact that the strapping should retain the splints in position, without exerting much pressure

If there is none remaining, the splints are on too tight

on the opposite side of the body and compare the two This precaution is particularly necessary in patients under twenty-one or so years of age, unless one has a very sound knowledge of the epiphyses and their ossifications

IS AN ANÆSTHETIO NEOESSARY TO REDUCE THE FRACTURE?

That is the next question, and the answer is. "Nearly always one must use an anæsthetic" Ignorance of forgetfulness of this is the commonest cause of bad results. I find that it is a common delusion that it is possible to reduce a Colles' fracture or a supracondylar fracture of the humerus without an anæsthetic. A few, a very few, fractures such as, for example, a fractured collar bone, can be reduced without an anæsthetic, but nearly always, if there is any displacement to reduce, an anæsthetic will be needed to do it

WHAT KIND OF SPLINTS SHOULD BE USED?

The simpler the splints, the better The textbooks, our hospitals, and manufacturers' catalogues are full of the most wonderful, intricate, expensive, and useless splints Remember the importance of not using opaque material, plaster of Paris, wood and aluminium will allow you to X-ray without removing the spliits. Personally I have a liking for plaster, especially in treating the hospital class of patient, most of whom seem to be endowed with the ability of a Houdini in loosening their splints But, though to the experienced, plaster is one of the best forms of splinting, to the inexpert it It is so easy to put plaster on too loose or too tight. It is so easy, too, to hide the deformity, and if an X-ray shows that the bones are in poor position, there is a tremendous temptation to think of all the trouble involved in taking the plaster off and applying a new one—and to leave the plaster

TREATMENT OF FRACTURES

should massage be begun

As for movements, it is a common mustake that passive movements should be begun before active movements. Of course, it is the other way about; active movements may be started as soon as the splints have been removed, but passive movements must not be attempted till much later. Personally I never allow forced movements to be started in the case of the upper limb till seven or eight weeks after the accident

MANIPULATION.

If, when union is well advanced, there is still considerable stiffness or limitation of movement, manipulation under full anæsthesia will improve the function of the limb, provided that the disability is not due to a bony lock. It is a pity that the advantages of manipulation are not more fully recognized. One frequently sees patients who have had a fracture or a dislocation and who have a joint, more or less stiff with adhesions, in spite of weeks or months of massage and movements; manipulation will work wonders in this type of case. An appreciation of the advantages of manipulation accounts for the "miracles" of bone-setters

Certain points must always be observed when manipulating a joint (1) under no circumstance must a joint be manipulated if it is the seat of active disease; (2) full anæsthesia is essential, gas is not sufficient, (3) steady, increasing tension must be used; sudden jerking movements must be avoided, (4) the line of fracture must be protected from all risk of injury; (5) the joint must be moved through its full range of movement once, and once only, (6) as soon as the patient has sufficiently recovered from the effects of the anæsthetic, he should be put through all his movements in order to convince him that the joint is freely movable. Two special warnings must be given. First, special care is needed in manipulation after a fracture

and the circulation will be interfered with Everyone knows that the splints must be adequately padded, that the ends must not press into the limb, and that they must not be put on so tight that they stop the circulation, but too many forget that splints that arc quite comfortable when they are put on, may be dangerously tight a few hours later Then, either the patient suffers agomes, and even possibly starts an ischæmia, or else he takes the splints off, and the deformity recurs This difficulty can be avoided if you remember the golden rule that the tightness of the splints should be determined, not by the strapping that holds them on, but by the tightness of the bandage that is put on over all; it is then possible to case the tension by loosening the bandage If the patient undoes the bandage, he gets immediate rehef without interfering with the position of the splints

Never try to reduce a fracture with splints, I have noticed that house-surgeons in the early days of their residence in hospital often try to do this. They get, for example, a green-stick fracture of the forcaim and instead of first reducing the fracture and then applying the splints, they take two straight splints and, putting them on tightly, hope that in that way they will straighten out the deformity. To use a splint for such a purpose is unpardonable, but it is very often done

MASSAGE AND MOVEMENT

The early massage advocated in the textbooks is ideal in theory, but in practice it is asking for trouble unless one does it oneself. A masseuse cannot be expected to take the splints down, massage the hmb, and put the splints on again without sometimes doing harm. Start the massage as soon as the splints are taken off and remember the older the patient and the worse the restitution of normal anatomical alignment, the sooner

the wound itself, do not put your finger or an instrument of any kind into it. Never wash, scrub, handle or touch the lacerated surfaces—either bone or soft parts. Spray the wound with iodine, and if there is any bone or tissue lying free—entirely free—then gingerly remove it with forceps, for if it is left it will form a foreign body. Then apply a large sterile dressing to the whole area—never put in a primary drain—reduce the fracture, and splint the limb

If possible the dressing should not be disturbed for ten, twelve or more days. During the first forty-eight hours the temperature will probably rise to 100° or 101°, but the dressing should not be taken down. The indication for examination is not this primary pyrexia. There are two elevations of temperature, one primary, due to the breaking down of the blood clot, starting within forty-eight hours, larely rising above 101° and subsiding within another forty-eight hours. If the temperature continues up to 102° or 103° in the second forty-eight hours, then is the time to separate the dressings, and if there is evidence of acute suppuration, lay the wound open in order to provide adequate drainage.

IS AN OPERATION NECESSARY?

Certain fractures, such as those of the patella, the olecranon, the head of the radius, the carpal bones, the scaphoid, and fracture dislocations of the head of the humerus frequently require operative interference, but apart from these cases the more efficient and experienced a surgeon becomes, the fewer cases he will need to operate on During the year 1927, 238 cases of fracture of the shafts of the radius and ulna were treated at the fracture chinic at the Northern Hospital, Liverpool, these cases were all between one day and six weeks old, and only two patients had to undergo an open operation, and no cases of fracture of the leg or thigh have

of the patella or olecranon as there is a great risk of re-fracturing the bone. The second warning is in regard to mistaking traumatic arthritis for adhesions. Traumatic arthritis follows an injury after an interval of free movement, lasting usually over a fortnight, as the cartilage does not become inflamed till it is actively vascularized by vessels growing into it. The correct treatment of this condition is rest. Stiffness due to adhesions, on the other hand, comes on very soon after the injury and, whereas traumatic arthritis makes movement of the joint painful in all directions, adhesions limit movement in one or more, but not in all directions

THE TREATMENT OF COMPOUND FRACTURES

The textbooks give very elaborate instructions as to how one must excise the edge of the wound, cut away any tags of torn tissue, etc etc, a lengthy procedure requiring considerable operative experience and all the ceremonial of the operating theatre Yet I have found that the majority of cases which had little or nothing done to them did well as a rule, but those treated as the books suggested generally became very septic. striking was the contrast in results that for some years I have adopted this principle of dolce far mente in every case in which there was not immediate need to suture a nerve, a muscle or tendon, to hgate a vessel or to amputate, and I should advise the practitioner who is called upon to treat a compound fracture to decide first whether any of these procedures are required; if they are, the patient should be treated in hospital by a surgeon, if they are not, he may undertake the treatment himself

All that is done is as follows. Anti-tetanic serum is given, the patient is anæsthetized, and with full asceptic precautions the actual wound is covered by a layer of sterile gauze. Then the surrounding area is cleaned with ether and painted liberally with iodine. As for

TREATMENT OF FRACTURES

a collar and cuff, the elbow should be supported on a pillow, and if a sandbag is placed between the shoulders or the shoulder is allowed to hang over the edge of the bed it will be found that the weight of the himb will bring about reduction

Only in exceptional circumstances should fixation of the shoulder be retained for more than three weeks. The only common cause of trouble after a fracture of the clavicle is stiffness from adhesions, this can be avoided by not keeping the shoulder fixed for too long a period, and it can be cured by manipulation under an anæsthetic

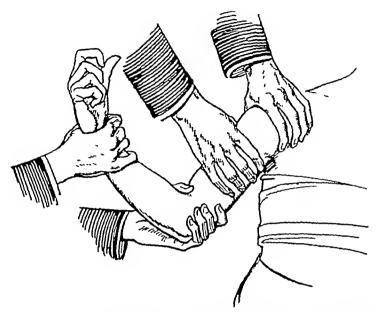
FRACTURES OF THE SCAPULA

In my experience fractures of the scapula are very satisfactory and simple ones to deal with, this view is, I know, at variance with the impression which one gathers from reading most textbooks Fractures of the body of the scapula only require the arm to be supported m a sling and be bound to the side of the chest by a bandage while, locally, the fracture is supported by overlapping strips of strapping Fractures of the coracoid and acromion processes need only a sling Fractures through the neck of the scapula should be treated as follows A pad is placed over the acromioclavicular joint and a bandage is taken round the elbow, tightened over the pad and the loose ends are tied under the opposite shoulder On tightening the bandage the humerus is drawn up to the acromion process and it carries with it the fractured neck The forearm is supported by a collar and cuff Fracture of the glenoid cavity usually involves the front margin, and in these cases it will be necessary to brace the shoulder back, either by a figure-of-eight bandage round both shoulders or by Sayre's method Stiffness of the shoulder is very common after fractures of the scapula, but manipula-

had to be operated on during the last three years. According to Ehason, in two years, at the Pennsylvania and Howard Hospitals, only ten closed fracture cases needed open reduction, and Sir Robert Jones has recently stated that he did not think he had had to operate on more than a dozen cases of fractured forearms, altogether. When we consider Sir Robert Jones's tremendous experience, and the very large number of such cases that he must have treated, we can realize how seldom operative interference is really needed

FRACTURES OF THE CLAVICLE.

Fractures of the clavicle are the commonest and kindest of all fractures They will put up with any kind of treatment and yet almost invariably give an excellent result and win us praise and thanks from our patients Non-union is practically unknown and, especially in children, any primary deformity rapidly becomes unobservable. The classical methods of fixation are usually unnecessary. When there is no deformity fixation of the arm to the side with a few turns of a bandage and the use of a sling for the forearm is all that is necessary. If there is a moderate degree of deformity this should be reduced by pulling the shoulder back and then a figure-of-eight bandage should be applied round the shoulders, in order to maintain them in this position, and the arm should be placed in a sling Experiment will show whether reduction of the deformity is best obtained with the shoulder raised or with it lowered, and adjustment of the sling will allow you to maintain the optimum position. Where other methods have failed to reduce the deformity, or when it is important to obtain an especially good cosmetic result, the best treatment is to put the patient to bed and keep him in the recumbent position for at least two weeks; the wrist should be slung from the neck by



Tic 2—Reduction of a fracture of the upper end of the humerus Assistant applies traction in the abducted and externally rotated position while the surgeon manipulates the bone ends together. Note counter traction by means of towel around chest

to undertake the treatment of the condition on his own responsibility.

When the great tuberosity is fractured, the muscles attached to it abduct and externally rotate the fragment and, therefore, it is essential to fix the limb in exactly the same position as is indicated in fractures of the surgical neck. Open operation is unnecessary, and the end-results are usually very satisfactory.

Always be on the look out for paresis of the deltoid muscle in injuries in the region of the shoulder joint, when it is present it must be treated in the abducted position on a frame until power is regained

FRACTURES OF THE SHAFT OF THE HUMERUS

Fractures of the shaft of the humerus form only a very small proportion of all the fractures seen, but they are always rather worrying owing to the frequency of non-union and of paralysis of the musculospiral

tion after about eight or ten weeks will correct this

FRACTURES OF THE UPPER END OF THE HUMERUS

Injuries to the upper end of the humerus may fracture the anatomical head, the surgical neck, or the tuberosity, and any of these may be associated with a dislocation of the head of the bone or with a paresis of the deltoid muscle Fractures of the anatomical head occur, like fractures of the neck of the femur, mostly in old people If they are impacted, thank Providence and leave them alone, apart from binding the aim to the If they are not impacted then I should advise the practitioner to refer them to a specialist as soon as possible Fractures of the surgical neck, on the other hand, are almost as kind as fractures of the clavicle, you will often find excellent functional and cosmetic results with atrocious anatomical alignment. fractures of the upper end of the humerus, the smaller upper fragment is abducted and externally rotated by the powerful muscles attached to the tuberosity It is, therefore, necessary in treating these fractures, to reduce and set the bone in the abducted and externally rotated position Extension and manipulation, as depicted in Fig 2, will generally give excellent results, but in difficult cases the best treatment is extension on a Thomas arm or knec splint, palm upwards and the aim abducted to a right angle. In less severe cases, after reduction, the optimum position may be maintained by an abduction frame, a plaster east or even by tying the hand behind the neck by means of a bandage passing found the opposite shoulder If the limb is kept in the abducted and iotated position for three or four weeks a good icsult can be guaranteed

When there is a dislocation of the head of the bone in addition to a fracture, reduction by manipulation is very difficult or impossible. Generally, open reduction is needed and the practitioner would be ill-advised

TREATMENT OF FRACTURES

steps in the treatment Reduction of the deformity, immobilization in acute flexion, and early active partial movements.

Reduction must be as complete as possible and a full general anæsthesia is advisable. When reduction is complete the carrying angle should be normal and



Fig. 4—Fracture in the region of the elbow. Note fingers touching shoulder, thin layer of gauze in fold of elbow, arm held in flexion by strip of plaster running along back of forearm and hand and down the back.

the fingers should be able to touch the shoulder (Fig 4). Fixation in acute flexion is the ideal treatment, but it must never be attempted if the elbow is much swollen Volkmann's ischæmic contraction is very common after these fractures, and, if it occurs, legal action is quite probable. You must be certain that the circulation in the forearm is unimpeded, feel the pulse at the wrist immediately after you have fixed the arm up, see it again in a few hours' time and again the next day.

nerve If there is much overlapping of the fragments, extension and traction on a Thomas splint will be advisable. In cases where there is little or no deformity the weight of the arm will provide sufficient traction if the wrist is supported by a collar and cuff and no arm sling is used. Every time you see the case make sure that there is no "drop wrist", if it should appear then the muscles of the wrist and hand must be protected from over-stretching by means of a

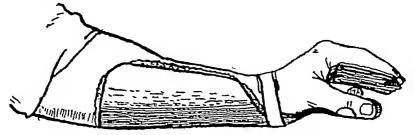


Fig 3 -Long cook up splint with thumb piece

long "coek-up" splint (Fig 3) If after two months there are no signs of returning function the nerve should be explored. In all eases the fracture will require to be splinted locally by means of two or three small straight gutter splints placed around the arm, these splints should be retained for five or six weeks, though after two or three weeks movement of the shoulder and elbow joints should be started

FRACTURES IN THE REGION OF THE ELBOW JOINT

Everyone knows Sir Robert Jones's golden rule in regard to fractures in the region of the elbow joint. "They should all be treated with the elbow fully flexed and the forearm supinated, with the single exception of fracture of the olecranon, which requires full extension" Unfortunately, this rule is too often applied unintelligently and many would seem to think that the treatment of these eases needed nothing more than flexion of the elbow. There are, however, three

TREATMENT OF FRACTURES

muscles will be weak or paralysed, and the paper will shp in and out quite easily. The fingers must be fully extended or the test will be fallacious

With fractures of the head or neck of the radius try to put the arm up in full flexion and then re-X-ray. If you cannot obtain full flexion, or if the X-ray shows bad position, then open excision of the fragment is the only satisfactory treatment, and the sooner it is done, the better

In fractures of the olecranon process, if the X-ray shows more than $\frac{1}{5}$ to $\frac{1}{5}$ of an inch separation between the fragments, then open operation and suture with catgut is advisable except in children, old people, or when there is a great objection to operation. All cases not treated by operation should be fixed with a long anterior splint, and the splint should be kept on for five to six weeks

FRACTURES OF THE RADIUS AND ULNA.

Fractures of the forearm usually arrive at the fracture clinic very incorrectly splinted. They must be fixed in full supination, for that is the position in which there is least chance of cross-union, and supination is the movement which is most difficult to retain if lost Two straight aluminium splints are needed, one long enough to reach from the tip of the elbow to the knuckles, the other 4 or 5 inches longer than the distance from the front of the flexed elbow to the palm of the hand Bend this splint to a right angle, a few inches from one end, so that it will fit comfortably into the elbow and down to the distal palmar crease, and, if possible, cut away the part over the thenar eminence The splints must be wider than the arm, or else the bones are pressed together by the bandage. Once more, it is necessary to beware of ischemic paresis

When the hand is fully supinated, the fingers point

If the elbow is much swollen reduce the fracture and rest the arm in a sling until the swelling subsides and then fix in flexion Never fix the arm in flexion by means of a bandage or strapping round the forearm and upper arm-it will very probably impede the circulation The safest, simplest, and best method of fixation is by means of a wide strip of plaster applied along the dorsum of the forearm and hand and then on to the shoulder and down the back. After about three or four days the elbow need not be so acutely flexed, but the forearm should be slung by the wrist close under the chin When pain has gone and the swelling subsided—varying from five to fourteen days the wrist may be dropped two or three inches and active movements allowed within that range patient is able actively to produce full flexion, the sling is lengthened every two or three days till a right angle is reached, when it can be discarded altogether If, however, the elbow becomes stift in the new position, mobilization has then been premature, the elbow must again be fixed in full flexion and a week allowed to elapse before mobilization is again attempted

The typical supracondylar fracture of children is not reduced by simply flexing the elbow, it is necessary to disimpact the fragments by exaggerating the backward deformity, then, by flexion and extension, the deformity is reduced

The possibility of fractures in this region interfering with the ulnar nerve must always be remembered. It is easy to test for this. Make the patient hold out both hands with the fingers fully extended. Place a sheet of paper in the inter-digital eleft of the hand on the uninjured side, and ask the patient to grip it without flexing his fingers. Then try to pull the paper away, and note that quite an appreciable amount of force will be needed to do so. Repeat the test on the injured side, if the ulnar nerve is injured, the interosser

TREATMENT OF FRACTURES



Fig 6-Reduction of Colles's fracture (Jones's method)

to maintain the normal anterior concavity of the radius at this point (Fig 7) The anterior splint must not come down further than the second palmar crease, and, if possible, should be cut away over the thenar eminence

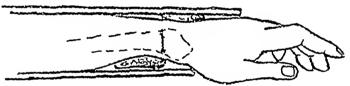


Fig 7—Diagrammatic representation of the position of the splints and pads in a case of Colles's fracture.

Leave the splints on for not more than two or three weeks, and then retain the anterior splint only for one more week. If the patient still has severe pain after an attempt has been made to reduce the deformity, the probability is that reduction is imperfect, good reduction usually eases the pain. If anatomical position is good, then any stiffness and pain is due to adhesions and can be improved by manipulation under anæsthesia.

FRACTURES OF THE WRIST.

In all injuries of the wrist examine for fracture of the scaphoid and for dislocation of the semilunar Both of these injuries are fascinating clinical entities on which it would be possible to write much, but it will be

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upwards, demonstrate this to the patient, and tell him to return to see you immediately if he finds that they have turned round and point towards his chest. After two to three weeks take off the anterior angular splint, and leave the posterior one on for one more week. In some cases this simple method of splintage will fail to maintain the fragments in good position; when this occurs, traction is indicated. A splint can be made out of heavy wire and plaster of paris. The upper arm is thickly padded and encased with plaster. The wire is bent to form a frame and is incorporated in the plaster. By one or other of these methods it is generally possible to obtain a good result

In the treatment of a Colles's fracture a good reduction will almost certainly give a good result. What is a good reduction, and how is it to be obtained? Normally the articular surface of the radius looks a little forward, in a Colles's fracture it is displaced and looks

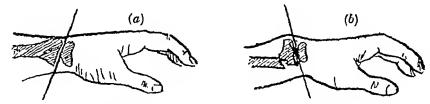


Fig 5 —Axis of the articular surface of the radius in (a) normal bone, (b) a case of Colles's fracture

backwards (Fig. 5). Never be content until the X-rays show that you have regained the correct forward inclination. As to the reduction, the text-books do not emphasize sufficiently the one important point the first essential is to disimpact the fragments by bending the lower fragment back still more, then, when it is free, bend it forward into the correct position (Fig. 6). Colles's fractures should be fixed in a position of semi-pronation. Without doubt the best splints are two aluminium gutter splints to which a spiral twist has been given. A small pad must be placed on the anterior surface, just above the lower fragment, so as

TREATMENT OF FRACTURES

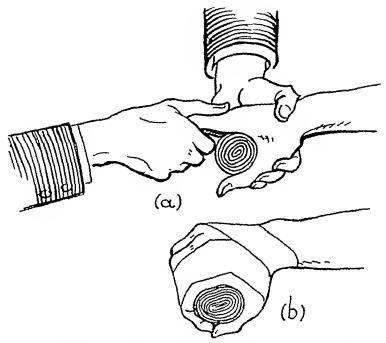


Fig 8 —Fracture of the metacarpal of the index finger (a) Method of traction and counter-traction, (b) completed dressing, plaster holding hand and bandage in position.

but because they are efficient and simple. The objection is often raised that the newer apparatus for the treatment of fractures is complicated and not available in general practice, and that the methods of treatment are too difficult to be used by the general practitioner. In actual experience this criticism is not substantiated. The complexity is more apparent than real, and the amount of apparatus that the practitioner must keep in readiness is small and inexpensive. His mechanical skill, ingenuity, and common sense may be relied upon to solve any problem that may arise in the treatment of the majority of fractures. There are, however, some types of fracture which are frequently so "difficult" that the practitioner would be ill-advised to treat them solely on his own responsibility.

sufficient to add that with a fractured scaphoid an attempt should be made to fix the wrist in full dorsification on a cock-up splint (Fig. 3), if it will not flex, then the bone must be excised, and that, as a dislocated semilunar practically always needs excision, the general practitioner would be well advised to refer the case immediately to the specialist

Bennett's stave, or an oblique fracture of the index corner of the base of the first metacarpal is too often missed and treated as a sprained thumb, with considerable resultant disability. Fix it with the thumb in the position occupied when holding a tumbler (see Fig. 3).

FRACTURES OF THE METACARPALS.

Usually in fractures of the metacarpals the normal anterior concavity is lost, and that is why the books tell us to bandage the hand over a bandage held in the palm (Fig. 8) This is excellent treatment in the usual type of case, but, not infrequently, the opposite deformity is present, and then the standard treatment is worse than useless, and the best fixation is with a straight posterior splint. In difficult cases traction should be used with the wrist dorsi-flexed and the metacarpa-phalangeal joints slightly flexed, a splint can be made from wire and plaster of pans and traction may be obtained from rubber bands.

Fractures of the phalanges—Fractures of the phalanges without displacement need only a straight splint—a wooden tongue spatula does very well, but if there is much displacement traction will be needed With the assistance of a handy-man a small wire splint should be made which will ride on the web of the fingers just as a Thomas splint rides on the pelvis

CONCLUSION

The methods of treatment described here are presented, not because they are better than other methods,

urticarial when heralding the same disease For instance, any one of half a dozen different kinds of prodromal rash may presage an attack of smallpox However, in smallpox this heterogeneous mass of eruptions may help the diagnosis when considered with other symptoms

Causation—These early rashes are probably caused by a generalized toxemia. Many diseases commence with a rigor, which is no doubt due to the sudden flooding of the tissues with toxins derived from the attacking organism, and it is rather remarkable that though so many diseases commence with a rigor so few commence with a rash

The diseases met with in this country which commonly present some form of prodromal rash are smallpox, chickenpox and measles, and, more rarely, encephalitis lethargica.

Chickenpox.—The prodromal rash of chickenpox is a frequent source of error Various rashes are said to occur, namely, scarlatiniform, morbilliform, urticarial or purpuric, but the one most usually seen is that which resembles scarlet fever. This scarlet rash may be very distinct and generalized, and many cases certified as scarlet fever and chickenpox combined are really chickenpox with a prodromal erythema.

Occasionally cases certified to be scarlet fever arrive at the hospital with a fading erythema and a varicella eruptive just appearing I know exactly what has happened, the child has developed a rash like scarlet fever and the doctor is sent for On his arrival he sees a rash indistinguishable from scarlet fever and there are no chickenpox spots I feel confident that the ensuing spots were not there when seen by the doctor, as they may be on the front of the trunk where they could not have been missed

The points of distinction between this prodromal rash and true scarlet fever are entirely those of degree

Prodromal Rashes.

By ELIOT SWAINSTON, M D Mcdical Superintendent, South-Western Hospital, Stockwell

HE commencement of most of the eruptive infectious diseases may be divided usually mto three stages (1) The mcubation period; (2) the prodromal period, (3) the period of eruption The incubation period varies with each disease, and to a less extent may vary in different cases of the same illness The prodromal period is the stage between the end of the incubation period and the commencement of the eruption This period is interesting and important, as the disease is usually most infectious at this time Unfortunately, this prodromal period is usually well advanced or entirely over before medical aid is sought However, a knowledge of the symptoms prevalent at this stage is of value where a previous case of an infectious disease has occurred and we are on the watch for the spread of infection

Measles during this stage is certainly shown by the presence of Koplik's spots; but in most diseases the prodromal period is vague, and, although the patient is not well, there is very little on which to base a diagnosis

In some of the eruptive fevers rashes occur in the prodromal period, but these, instead of being a help to diagnosis, are very often a source of confusion and may lead to error. The true rashes of measles and chickenpox are always more or less true to type they have a fixed time for appearing and their distribution and character can be rehed upon to a great extent, but with prodromal rashes this is not the case, they may not appear at all; and when they do occur they may be scarlatiniform, morbilliform or even

PRODROMAL RASHES

matous, petechial, or mixed The erythematous rashes are usually limited to the trunk and may be either morbilliform or scarlatiniform. The time of their appearance coincides with the lumbar pain so often complained of, in fact, in times of a smallpox epidemic a patient with some pyrexia, lumbar pain, and a patchy erythematous rash on the trunk must be looked upon with the gravest suspicion. Of these two types of erythema the morbilliform is the more common, it is found on the trunk, groins and in the axillæ, its diagnostic value is great and its prognosis is usually good The scarlatiniform rash has a similar distribution to the morbilliform variety, it is usually less bright than true scarlet fever, but there is a type of scarlet prodromal rash, the "astacoide" or lobster rash, of the French, which is very intense and usually ushers in an attack of smallpox with a grave prognosis. The scarlatiniform type, sometimes known as the livid rash, is similar to the scarlatiniform or astocoïde rashes but is deeper in colour and, as might be expected, only occurs in the most malignant cases

The rashes discussed above are more or less generalized, but sometimes the rash is localized even if it be an erythema. The more common localized rashes are petechial and their site on the body is usually the lower abdomen and the groins, an area which is sometimes referred to as the abdomino-femoral triangle, or the bathing drawers area, but the petechial rash may extend up the flanks to the axillæ. This triangular petechial rash, when associated with lumbar pain and a rise of temperature, is almost diagnostic of smallpox, and its presence is also of very great importance for prognosis. A few discrete petechiæ with transient erythema probably portend a severe attack and the prognosis must be guarded, but a mass of petechiæ amounting to what is practically a hæmorrhagic rash forecasts hæmorrhagic small-

The prodromal erythema, though it may be genealized is usually limited to the trunk, it is not so intense as the average scarlet rash, but, as we all know, scarlet fever may at times have a very faint eruption. The throat may be of assistance, as it is unusual to find marked injection of the fauces at this early stage of chickenpox, and the tongue may be of some help. The temperature is not a guide, as scarlet fever may be very mild, and chickenpox on occasions may be ushered in with fever

The other prodromal eruptions mentioned by some authors, namely, the morbilliform, the urticarial and the purpuric must be either very evanescent or very rare, as I have never met with them. The purpuric variety might be the onset of hemorrhagic chickenpox, in which disease there are hemorrhages at the base of the vesicles, and other patches of purpura, but the significance is not so grave as hemorrhagic smallpox

In measles various blotches, papules or macules may occur before the rash of measles comes out. The incubation period of this disease is usually about ten days, the rash generally appears on the fourth day, and it is during these first three days that these indefinite eruptions are seen. As a rule the prodromal eruption is blotchy, occurs in isolated patches upon the trunk, and is similar to the true rash but on a smaller scale.

A scarlatiniform rash is not at all rare and I have seen a few cases where the diagnosis of scarlet fever appeared to be the correct one until the presence of Koplik's spots and mild coryza threw doubt upon that disease. Of course the two diseases may co-exist but I have found these conditions in cases which have developed in hospital, and in which the presence of previous and subsequent cases of scarlet fever have been non-existent

Smallpox.—The prodromal rashes may be erythe-

PRODROMAL RASHES

parts of the body. Again, a careful search of other signs, and an inquiry into other symptoms, may clear up the diagnosis. The buccal mucous membrane should always be looked at, the fauces carefully inspected, and if chickenpox is known to be rife in the neighbourhood the presence of isolated vesicles or papules should be searched for where a mild scarlatiniform rash is apparent without other signs of scarlet fever

The staff at the fever hospitals have a great advantage over 'the general practitioner', they can examine the patient, even an adult, practically from head to foot, if necessary, by the judicious use of the covering blanket. The hospital doctor does not have to make his examination in the presence of some criticizing relative to whom he is expected to give an immediate diagnosis. At the hospital the patient can be sent for observation to an isolation room to be seen both by the doctor and his chief some time later when signs and symptoms have developed

The practitioner, on the other hand, is in a most difficult position, he is expected to diagnose without fail a case in which the symptoms are only developing; and on his diagnosis so much depends. The removal of the patient to hospital, the detention of the other children from school, and probably the prevention of the adults from following their employment all depend on his verdict. If the hospital doctor cannot help his practitioner colleague, at least he can sympathize with him

pox, a disease which is always fatal

The above may be summarized by saying that the prodromal rashes of smallpox may be either local or general, that the general rashes are usually erythematous, patchy or morbilliform, and that the local rashes are usually petechial. That in dealing with generalized erythematous rashes the morbilliform is not of so severe a significance as the scarlatiniform, and that in the case of the local triangular rashes their prognostic portent depends upon their intensity *Encephalitis lethargica*.—This disease may commence

with a rigor, but more usually the onset is gradual and the main symptom complained of is headache. At this stage a rash or rashes may appear which can be looked upon as either early manifestations of the diseasc or as prodromal rashes These are very like the prodromal rashes of other diseases but usually rather faint in character They may be either morbilliform or scarlatiniform, but it is not very likely that the resemblance to either of these diseases will be strong enough to cause them to be diagnosed in error. condition is better described as consisting of faint patches of erythema, more or less extensive in distribution, situated on the trunk or limbs or both and inclined to be blotchy in character. Another fairly common early rash is herpes, usually herpes labialis, which from its frequency in pneumonia may be a possible source of confusion, but the subsequent course of events will be decisive

As stated above these prodromal rashes may lead to errors in diagnosis, but if their occurrence is constantly kept in mind errors may be avoided to a large extent, and the presence of the rashes may be helpful in forecasting the advent of the disease proper

The surest way to avoid being deceived by a rash is to see the whole extent of it, or at any rate as much as possible as its characters may vary on different

blood-stream from the soft tissues and bones. Direct proof that this drain on bone calcium occurs has been furnished by Bauer, Aub and Albright⁶ and Lambie, Kermack and Harvey. The former observers showed, both radiographically and histologically, that the bone trabeculæ in rabbits become much thinned and deficient in calcium after the continued administration of parathyroid extract, the latter described similar effects in rats and noted a decrease in the ash of the bones Similar changes could no doubt be produced in man by continued administration of excessive doses of active parathyroid. It may then be accepted as proved that excessive activity of the parathyroid glands produces decalcification of the bones This knowledge has thrown a new light upon the old observations of the frequency of hyperplasia and tumours of the parathyroids in osteomalacia and osteitis fibrosa

OSTEOMALACIA

There is evidence to suggest that the pathological changes in bone described as osteomalacia may be produced by several distinct causes. These may be divided into deficiencies of diet and disorders of the endocrine glands. It is difficult to separate the influence on the patient of these two etological factors since not infrequently both are involved. Sometimes no cause is forthcoming except a defective supply of calcium and vitamin D in the diet or unwonted seclusion from sunlight⁸. such patients are readily cured by improving the mineral content of their food and administering vitamin D, either as irradiated ergosterol^{10, 11, 12, 13, 14} cod-liver oil ^{8, 9, 15} or indirectly as ultra-violet irradiation. These patients have a negative calcium balance—that is, they lose more than they absorb—a low blood calcium, and a deficiency of calcium in the

The Relation of the Parathyroid Glands to Disorders of Bone.

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HE parathyroid glands play a very important part in certain disorders of bone recent investigations have shown this beyond doubt. It has long been known that in a number of diseases showing great alterations in bony structure, pathological changes in these glands occur, although these changes have been relegated to a minor place in the pathology and regarded as entirely secondary to the established skeletal disease. This view is no longer tenable in the case of generalized osteits fibrosa and a certain form of osteomalacia, and it is now considered that the bony changes in these diseases are of parathyroid origin.

This new view has resulted from increased knowledge of the functions of the parathyroids which followed the preparation of an active extract of the glands by Collip in 1925. He showed that injection of the active principle raised the blood calcium in animals and man, and provided a complete substitution therapy after removal of the glands 1, 2 Later, when it was found that the extract did not produce the rise in blood calcium by increasing absorption or limiting excretion of the element 3, 4, 5, the only explanation left was that the blood-calcium was raised by the withdrawal of calcium into the

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Some writers consider that this is not sufficient evidence that the ovaries are concerned in causing the disease, and suggest that opphorectomy benefits the patient only by preventing further pregnancies, the ovaries being invariably normal on histological examination. But opphorectomy often greatly improves severe cases within so short a time that the prevention of another pregnancy could not have played any part. This was well shown by a case of Hellier's a few years ago. Moreover, negative histological evidence is valueless in deciding whether or not ovarian function in these patients is normal. The great preponderance of the disease among girls at puberty. also suggests that the ovaries play an etiological part in what way ovarian function is disordered is not known, and much experimental investigation is needed before precise knowledge on this point can be obtained.

Most of the other organs of internal secretion have from time to time been suggested as producing osteomalacia through defects in their activities, but there is not any reliable evidence that any of them except the parathyroids are concerned. There is now considerable support for the view that a small proportion of cases of osteomalacia are due to disorders of the parathyroids. Erdheim²⁵ was the first to point out the occurrence of enlargement of the parathyroids in the disease, and many observers have since confirmed his observations. Simple hypertrophy, hyperplasia and benign or malignant tumours have been described. The proof that such lesions may be accompanied by a functional hyperactivity with its secondary bony changes has been suggested by the fact that certain patients show an increase in blood calcium³⁷ and not a decrease as is usual in osteomalacia. Studies of the

bones They are very subject to tetany The negative calcium balance and deficiency in bone calcium cannot be due to excessive parathyroid activity in this type of case, because if that were so the blood calcium should be raised An identical condition may be produced in adult animals by a diet poor in calcium and in vitamin D, and the microscopical differences in the bones between this condition and rickets, produced in young animals by the same diet, are slight and are such as would be expected from the fact that one disease occurs in adults and the other in early life at a time when the cellular activity of the bones is very great Moreover, the fact that irradiated ergosterol cures the disease, strongly supports the view that this type of osteomalacia is the adult analogy of rickets "Hunger osteomalacia," as seen particularly in Vienna at the close of the late war, was a mild form of this type, differing only in the fact that a lack of phosphorus was the most striking chemical alteration in the bones 16

It is well known that osteomalacia is prone to affect adolescent girls and pregnant women. It might be supposed that the especial hability to the disease during pregnancy is due to the child requiring calcium for its skeletal development, and this is the probable explanation of some mild cases beginning towards the end of gestation. But this view is not valid for the great majority of cases occurring during pregnancy because the feetal demand for calcium is trivial until the last two months of gestation, whereas, when osteomalacia occurs during pregnancy it usually begins before the seventh month and is frequently severe. Here also defective diet undoubtedly plays some part in many cases, but it is suggested that the ovaries are more directly concerned in initiating the disease because

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is usually lowered. After removal of the hyperplastic or adenomatous parathyroids, the serum calcium rapidly falls to normal, the excessive excretion ceases and a positive calcium balance is established; for example, in a recent case investigated very fully by D. Hunter, 60 the serum calcium dropped from 15.5 mgms per cent to 9.1 mgms per cent within forty-eight hours after removal of a parathyroid adenoma. If most of the parathyroid tissue is removed, the serum calcium falls to a low level and acute tetany occurs within a few days. This is readily treated by giving a diet rich in calcium with several grams of calcium carbonate or lactate daily, assisted if necessary by injections of calcium chloride and Collip's "parathormone"

The later effects of operation are progressive, and rapid relief of pain, tenderness of bones, and general disability, and recovery of muscle tone, and strength, later, calcium deposition occurs in the bones to repair the areas where decalcification has been most marked This is shown by increasing density of the X-ray shadows 55 57, 50 Mandl's original patient who was bedridden at the time of his operation showed all these features and is now able to walk considerable distances 49 This process of repair was not seen in some of the cases recorded, although removal of the parathyroid tumour cured the hyperparathyroidism, arrested the bone lesions and relieved the symptoms The histological picture in severe cases suggests, however, that repair by recalcification of rarified areas might not always be expected Evidence accumulates that hyperparathyroidism is a constant feature and this strongly supports the view that decalcification is the primary lesion in the bones, and that many of the complex histological changes described to occur are secondary The most important of these are fibrous trans-

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mineral metabolism, including chemical analyses of the bones, are needed to show that hyperparathyroidism is the cause of the bony changes. The diagnosis of the nature of the disease in these patients is important in relation to treatment. In a patient with clinical and radiographic evidence of osteomalacia, with a raised blood calcium, in whom a proper diet including irradiated ergosterol does not produce rapid improvement, an exploratory operation for a parathyroid tumour should be advised

OSTEITIS FIBROSA.

Osteomalacia of the type just described is probably closely allied to, if not identical with, the generalized osteitis fibrosa first described by von Recklinghausen in 1891 The significance of the parathyroid enlargement frequently noticed^{31, 30, 41–43} m this disease at post-mortem examination has been appreciated only recently In some patients the enlargement can be detected clinically and may be confused with an adenoma of the thyroid The histological picture is sometimes simple hyperplasia, but more frequently a definite tumour is present in one or other of the parathyroid glands, usually an adenoma, which is surgically removable. These pathological changes are accompanied by an increase in functional activity which is shown by persistent increase in blood calcium, a secondary increase in calcium excretion and a negative calcium balance 48-60 The proof that this hyperfunction is responsible for the bony changes is furnished by the records of patients in whom removal of parathyroid adenomas 40, 51, 55, 57-60 has been followed by arrest of the and, later, by gradual improvement The serum calcium in these patients before operation may be as high as 20 mgms per cent, and when such values are found the morganic phosphate of the scrum

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is usually lowered. After removal of the hyperplastic or adenomatous parathyroids, the serum calcium rapidly falls to normal, the excessive excretion ceases and a positive calcium balance is established, for example, in a recent case investigated very fully by D. Hunter, 60 the serum calcium dropped from 15.5 mgras per cent to 9.1 mgms per cent within forty-eight hours after removal of a parathyroid adenoma. If most of the parathyroid tissue is removed, the serum calcium falls to a low level and acute tetany occurs within a few days. This is readily treated by giving a diet rich in calcium with several grams of calcium carbonate or lactate daily, assisted if necessary by injections of calcium chloride and Collip's "parathormone"

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formation of the bone-marrow and a new osteoid tissue taking the place of the bone absorbed, these suggest that there has been an unsuccessful attempt to strengthen the bony framework. As much of this tissue becomes dense, deposition of calcium in it may be difficult after parathyroidectomy

These recent investigations into osteomalacia and osteitis fibrosa emphasized the importance of changes in calcium metabolism as the primary factor in the production of the bony condition, and they have diminished the importance of differences in the histological picture. Intermediate stages occur between typical osteomalacia and typical osteitis fibrosa. As long ago as 1889 Hirschberg described a condition identical with the latter as "osteomalacia with cysts" the main differences probably depend largely upon the exact extent and type of reaction on the part of the cellular tissue in bone to mechanical weakening through loss of calcium salts

THE PARATHYROIDS IN RELATION TO OTHER DISEASES OF BONE

Enlargement of the parathyroid glands has been recorded in association with other diseases affecting bones, but the significance of the relationship is not understood. Dietrich, 61 Ritter, 35 and Bauer 62 described enlargement of the glands in patients suffering from osteogenesis imperfecta, and Todyo 30 and others have found enlargement in Paget's osteitis deformans. Investigation, however, has not revealed any evidence that hyperparathyroidism is a usual feature in these diseases 63 64 40. Osteitis deformans resembles generalized osteitis fibrosa in regard to the histological character of the bone changes, with the exception that in osteitis deformans areas of increased calcification occur. Hyperparathyroidism is not present

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in Paget's disease, and this indicates that the essential nature of the malady is different

There is good reason to believe that the parathyroid glands hypertrophy in certain experimental disturbances of calcium metabolism For instance. ultra-violet irradiation causes hypertrophy of the parathyroids in rabbits, which is accompanied by rise in the blood calcium 65 In such animals. subsequent partial parathyroidectomy is followed by a more rapid restoration of the blood calcium to normal than in the case of non-irradiated controls This indicates that the parathyroid hypertrophy produced by irradiation results in a functional hyperactivity and a more active response to emergencies by the glands Marine⁶⁶ has shown that parathyroid hypertrophy occurs in hens which are given a diet deficient in calcium, and Luce⁶⁷ confirmed this in the case of rats This suggests that the parathyroid hypertrophy in severe rickets 35, 68, 69 is an attempt to ensure that the blood calcium is maintained above the level at which tetany is precipitated. even at the expense of making the bone lesions more severe This principle may also account for some of the examples of unexplained parathyroid hyper-trophy which occur in other diseases where disturbance of calcium metabolism and bony structure are found.

THE PARATHYROIDS AND THE HEALING OF FRACTURES

Interest has recently been shown in the question of the treatment of delayed union of fractures with Collip's parathyroid extract. The amount of inorganic phosphate in the serum is raised during the normal repair of fractures, 70 but in cases with delayed callus deposition this rise is not present. No corresponding changes occur in the level of the serum calcium. Recently a number of reports have appeared advocating the use of parathyroid treat-

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ment for delayed union According to some observers⁷¹ this treatment delays the calcification of fracture callus in animals, but their method of estimating the degree of calcification is open to criticism On the other hand, Hueper⁷² found that the treatment increased the degree of calcification in cats, as estimated radiologically and histologically, some 20 to 35 per cent in four weeks when compared with controls Defective calcification of fracture callus occurs in chronic parathyroid deficiency in cats73 and rats 74 Removal of three of the parathyroid glands causes a fall of about 3 mgms per cent in the serum calcium, and delays bony union of fractures for as long as five weeks 75 When the serum calcium returns to normal, bony union rapidly follows

Clearly, then, parathyroid treatment may be of benefit in cases of delayed union of fractures—a condition not infrequent in elderly patients. The benefit of this treatment probably depends upon the degree of hypercalcæmia, although the excess of calcium comes from the bones It has been claimed that such mobilization from the bones should delay the deposition of calcium in callus, since this tissue might be affected along with the bones in general. This is not so, because the tissues at the site of a fracture are in a condition when they readily attract and deposit calcium salts from the surrounding fluids. In other words, it may be the particular state of functional activity at the site of a fracture which enables parathyroid treatment to be of benefit in accelerating the rate of calcification.

PARATHYROID EXTRACT IN THE TREATMENT OF LEAD POISONING

Lead resembles calcium and certain other metals in that when it is absorbed over a prolonged period

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it is stored in the bones. Most of the metal is probably present in bone as insoluble tri-lead phosphate, Pb₃(PO₄)₂, a compound which is exceedingly sensitive to the reaction of the surrounding medium, and which is readily converted into more soluble derivatives by slight changes towards the acid or alkaline side of the usual body reaction. This is the basis on which the mobilization of lead from the bones is founded, and explains the increased excretion which occurs in poisoned animals or patients when considerable quantities of acids or alkalis are administered. But this kind of treatment under normal conditions also mobilizes calcium from the bones: and the analogy between the behaviour of lead and calcium is seen also in the effects of parathyroid extract upon lead excretion in chronic plumbism Hunter and Aub⁴ showed that an average daily dose of 55 units of Collip's parathyroid extract raised the excretion of lead in cases of chronic plumbism from an average of 1 to 2 mgms to as much as 6 to 10 mgms for a three-day period—this is a greater increase than can be produced in any other way. The blood calcium and calcium excretion were increased at the same time just as in normal persons receiving the same treatment Lead and calcium excretion followed a roughly parallel course, and, in both cases, increased excretion persisted for about a week after the treatment was discontinued

The mobilization of calcium from the bones can be produced readily at any subsequent time by further administration of parathyroid extract, but Hunter and Aub found that lead behaved differently from calcium in this respect, and that subsequent treatment with the extract, after one course of injections, did not again increase the excretion of lead. The initial course of treatment usually lasted for about one to three weeks, and as the total excre-

tion during this time was a matter of milligrammes only, it was clear that the stores could not have been exhausted, since half a gramme or more may be present in the bones in such cases of chronic plumbism. They suggested that the initial treatment exhausted a supply of stored lead which was present in a form that was readily mobilized, and that the remainder of the lead present in the bones was combined in some other form which was not affected by this treatment.

These observations have an important bearing upon the treatment of chronic lead poisoning since they indicate that the metal is rapidly eliminated by administering parathyroid extract. This treatment is a useful addition to the low calcium diet and administration of acids, ammonium chloride, or potassium iodide usually employed. To obtain the best results, serum calcium determinations should be made to avoid any danger of hypercalcæmia, and a careful watch kept upon the general condition of the patient to prevent the too rapid mobilization of lead from the bone depots setting up acute toxic symptoms, such as colic, palsy or encephalopathy Whenever these toxic symptoms are present it is advisable to administer a high calcium diet, supplemented by calcium medication, in order to facilitate temporary storage of lead in the bones; 76 further treatment to eliminate the stored lead can be carried out later when the patient's toxic symptoms have abated

CHRONIC HYPOPARATHYROIDISM.

Chronic hypoparathyroidism sometimes occurs spontaneously, but it is usually due to accidental removal of most of the parathyroid tissue in operations upon the thyroid gland. The condition has been widely studied experimentally, and there is general agreement

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that it is characterized by three main featureshability to acute tetany, especially under certain conditions such as pregnancy or lactation, the frequent occurrence of cataract, and defective calcium deposition in the teeth during the period of growth All these features may occur in patients tetany is determined by a fall in the blood calcium, and may occur occasionally during the later months in normal pregnancy owing to the heavy demands for calcium then made upon the mother Tetany is very common during the last two months of gestation, when the mother is suffering from chronic parathyroid deficiency. This suggests that the parathyroid hypertrophy, which normally occurs during pregnancy, and lactation is accompanied by increased functional activity, and is a protective measure to prevent the blood calcium falling below the level at which tetany begins It is also, in all probability, the means by which the mother's skeletal reserves of calcium become available to the infant, in this connection Hanau77 showed long ago that some drain on the bone reserves of the mother occurs very frequently during pregnancy

According to Greenwald⁷⁸ the parathyroid hormone acts by increasing the amount of calcium which the blood can hold in solution, if this be so, the tendency to cataract would be explained by the deposition of calcium in the lens when an insufficient supply of the hormone is provided. Greenwald's suggestion is, however, open to doubt, in completely parathyroid-ectomized dogs the serum calcium can be permanently raised to normal by the oral administration of calcium, and this would not be expected were the parathyroid hormone required simply for the solution of calcium Further, it might be anticipated that a fall in the blood calcium produced by injecting oxalates, phosphates, or sodium bicarbonate would lead to alterations in the lens

Eiseman and Luckhardt⁷⁸ failed to demonstrate such changes Calcium deposition in the tissues is not a general feature in chronic hypoparathyroidism; cataract is the only established example, though similar deposits may occur in the middle ear since dogs frequently become deaf⁷⁹ and the association of chronic tetany and otosclerosis in patients is known ⁸⁰ If cataract of this type depended entirely upon precipitation of calcium from the tissue fluids, widespread deposits should occur as in the case of metastatic calcification. All these facts suggest that in chronic parathyroid deficiency, cataract is primarily due to changes in the lens other than the deposit of calcium salts, and that such deposition is secondary. This view is supported by the fact that treatment with parathyroid extract often fails to arrest the cataract

Failure of proper calcification of teeth is a constant finding in young parathyroidectomized rats \$1-85 Instead of the normal semi-transparent yellow appearance the teeth become opaque, white and brittle, and histological examination shows that deposition of calcium in the dentine is deficient, and that the enamel is thin or absent. Erdheim showed that if a parathyroid graft was made on these animals satisfactory, calcification of the teeth occurred with a return to their normal appearance. Similar alterations in the teeth have been described to occur in children, but they are usually absent in post-operative tetany in adults \$7-88. Patients with post-operative hypoparathyroidism often show loss of hair and poor irregular growth of the nails it has not been shown that these changes are not due to simple thyroid deficiency. Defective calcification of the bones in young parathyroidectomized animals has been described, but the experiments are not valid since the changes do not occur if careful control of the diet

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has been exercised.85

There are many other examples of the close relation between the glands of internal secretion and bone disorders; for instance, hypothyroidism causes defective skeletal development, and hyperthyroidism may result in osteoporosis The activity of the pituitary also controls bone structure, but it is only recently that the parathyroids have been proved to play any important part. The investigations reviewed in the present paper show that normal parathyroid function is essential for the proper structure of the skeleton, and indicate in what way this recent knowledge may be used with benefit to the patient

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a bacillus which was called Bacillus psittacosis (Nocard's bacillus) In 1896, Gilbert and Fournier reported nine cases of psittacosis with 2 deaths in Paris, and isolated Nocard's bacillus from the blood of a patient and from a parrot; but there was not any agglutination with the blood of two other patients suffering from psittacosis. The incubation period was between 7 and 12 days. Sicard, in 1897, described five cases of psittacosis in a Parisian family which kept parrots, two of which were examined after death, from the blood of one, though not from the other, Nocard's bacillus was isolated. Further cases were reported by Delamarre and Descazals (five cases), Dupuy (two cases), and others

In 1894, Palamidessi and Malenchini described a house epidemic in Florence, five persons, of whom three died, were taken ill with pneumonia 6 or 7 days after the death of a parrot, one of four recently imported from the Argentine The pneumococcus was isolated from the sputum and urine of three patients during life by Silvestrini, and from their lungs after death In a house where another of these parrots died, two persons went down with pneumonia Longa drew attention to an epidemic that had occurred at the same time in Prato, near Florence, seventeen people were taken ill and eight died, and this outbreak coincided with the death of many imported parrots 1897, house epidemics of pneumonia in 14 persons occurred in Genoa after they had received parrots as gifts, eight people died, Maraghano found diplococci in one of these cases Haedke described an epidemic of pneumonia in a family in Stettin in 1896 after they began to keep a parrot which died from diarrhea. No streptococci, Nocard's bacillus or proteus bacilli were found in the bird. Four persons became ill and three died The post-mortem examination of one patient revealed streptococci in the lungs, liver, spleen,

Psittacosis.

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HE epidemic in Uster, Switzerland, described by Ritter in 1879, under the name of "pneumotyphus" (pneumonia with the typhoid state) may be regarded as the first recorded occurrence of psittacosis Of the seven patients, four died, and the necropsy showed atypical lobular pneumonia and an enlarged spleen The patients had frequented a room where parrots were kept, the incubation period was from 9 to 14 days Many of the parrots died, but nothing positive was found when they were examined after death In 1882, Ost reported four cases of pneumonia at Bern in a family after receiving pairots from London, two patients and two parrots died Wagner, in 1884, reported a house epidemic under the name of "pneumotyphus", of the three patients who were engaged in the parrot trade, one died, and micrococci and bacilli resembling anthrax bacilli were isolated from the lungs Later he described three further cases of this disease in people working in the same shop. Finkler recorded an outbreak in 1887, six persons were taken ill with severe pneumonia, and, of these, three died, cultures of streptococci and Staphylococcus pyogenes were obtained after death from the lungs of one of these patients Finkler suggested that possibly a parrot kept in the flat was responsible for the epidemic. During the Paris epidenic of 1892 special attention was drawn to parrots as disease carriers. About 300 out of 500 parrots recently imported from South America had died, and forty-mine persons, who had all been in contact with the sick parrots, were attacked by pneumonia and sixteen died In 1893, Nocard isolated from the bone marrow of an exhumed pairot

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followed the Argentine one in 1929 Barros, Marquez and others described epidemics in Cordoba, where there were 64 cases, of which 12 died, Alta Gracia, Tucuman, Buenos Aires, and elsewhere Many persons and parrots died Santilan isolated from a parrot a paratyphoid bacillus An epidemic in Buenos Ayres m which twelve actors became ill and two died is interesting, as the parrot which took part in the play also died. A connection between these and the European outbreaks remains to be proved Elkeles. Grunwald and Meyer reported the following epidemic in Berlin in November 1929 A geologist, who brought four parrots from Brazil, four other members of his household, and a lady to whom he had given two parrots, fell ill with atypical pneumonia. He and a servant died. But his daughter aged eleven and a half years, according to the description, had, in my opinion, influenza and not psittacosis. About the same time three couples who each in turn were in charge of a recently imported parrot became ill with atypical pneumonia, and two of the men died cases were all carefully investigated, no typhoid or paratyphoid group bacilli were found. The micro-organisms such as streptococci found in the blood did not give any clue to the origin of the disease Examination of one of the parrots which died showed Bacillus proteus only in the organs Investigations are still in progress and include a search for a filtrable virus At a meeting of the Berlin Medical Society, Martini mentioned four additional cases of psittacosis in 1929, at the necropsy of the fatal case broncho-pneumonia was found. In the epidemic of psittacosis at Hamburg in 1929, recorded by Embden and Adamy, the first cases were in a couple who purchased a newly imported parrot which later died. The blood of the male patient yielded Streptococcus hæmolyticus In three other famihes, each possessing a recently imported parrot which

and in the heart's blood. Leichtenstern recorded an outbreak in Cologne in 1898, a woman bought a parrot which soon died, but neither Nocard's bacillus, nor streptococci could be found in its organs and intestinal Twelve days after buying the parrot the woman and one of her daughters became ill with severc atypical pneumonia and, later, five other members of the family and two nurses also became ill, four of these died. At the necropsy of one patient pneumoma was found, the heart's blood grew streptococci and Staphylococcus aureus, and the lungs diplococci and streptococci Another epidemic of psittacosis at Zulpich in the summer of 1909, in which 26 persons (aged 13 to 69) became ill with a severe form of atypical pneumonia, was thoroughly investigated by Bachem, Selter, and Finkler Few of the patients had any sputum, very little or any cough, splenic enlargement or rigors, but had continued fever ending by lysis, delirium and somnolence Five patients died the patients had been in a room recently occupied by imported parrots. The incubation period was from 2 to 14 days Streptococci in almost pure culture were isolated from the lungs of a patient and were regarded as the cause of the disease The parrots were killed, but though there were not any macroscopic and microscopic changes, bacteriological examination proved that there were streptococci present similar to those found in the above-mentioned case authors concluded that (1) there is a disease of parrots which can be transferred to human beings and (2) the parrots can be disease carriers even if apparently healthy. In North America, cases of psittacosis were described by Vickery and Richardson, McClintock, Sailer and others, and in England by Beddoes, Gulland, Thomson, Hutchison and others Cases have also been recorded in other countries

The present outbreak of psittacosis in Europe

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gave an account of two sisters who in July 1929 were presented with two parrots which became ill five weeks later, both sisters and both parrots died, the necropsy of the former showed atypical pneumonia Kahebe reported pneumonia in a woman and her brother-in-law who petted a sick parrot, which died; the woman died.

The following is a brief account of two cases of psittacosis with characteristic features under my care.

Case 1 -A man aged 24 years, of strong constitution, had only once been ill in bed before, namely five years before when he was confined to bed for a fortnight by the effects of a severe thrashing The onset of the present illness was sudden with headache, fever, and sore throat, for the next few days he felt ill, but there was not A few days later there were signs of lobar pneumonia in the posterior inferior lobe of the right lung-dullness, bronchial breathing, and crepitations, but without any pleurisy Pain and sputum were absent throughout For fourteen days the temperature ranged between 100° and 103°F and then fell by lysis pulse was remarkably slow, for example, with a temperature of 103 8°F the pulse rate was 98, with a temperature of 102 2°F the pulse was 78, and with a temperature of 101°F, the pulse-rate was 72. On some occasions it was irregular. The blood-pressure was 75 to 85 diastolic and 120 to 140 systolic The spleen was not palpable There was construction throughout At my first visit to the patient I noticed that a parrot in the same room was ill and ordered its removal, this was not done until two days later bought from a London shop the parrot was quite healthy patient had petted the parrot and kept it in his room days after its purchase the bird showed signs of malaise, its wings drooped, it became morose and gradually lost its appetite. As it was shivering the patient covered it with his own rug and fed it by putting its bill into his own mouth. Its condition did not prove and diarrhea was noticed The patient then became ill, and a week later the parrot died, the necropsy carried out by Mr C Hicks, showing that enteritis was the main cause of death

Case 2—The nurse attending the previous patient, aged about 55 years, also petted and looked after the sick parrot until it was removed. After twelve days of nursing, symptoms and signs similar to those of her patient became apparent, and about five days later consolidation of almost all the right lung and the lower lobe of the left lung became obvious. She became delirious and collapsed, and died two days later in St George's Hospital. The necropsy showed pneumonia of almost all the right and of the lower half of the left lung, in a stage between red and grey hepatization. The right side of the heart was much engorged and there was cloudy swelling of the liver, kidney, and heart. This, therefore,

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soon died, eight persons contracted pneumonia; two died, and at the necropsy lobar pneumonia was found. At the same time the wife of the shopkeeper who had sold some of these parrots went down with pneumonia, from which her husband had suffered some months previously.

Hegler also reported two outbreaks at Hamburg: in the first, in July 1929, a woman and her two children were simultaneously affected with pneumonia, two died Bacteriological examination was negative, except for pneumococci. Three parrots became ill, two died; bacteriological examination was negative. A monkey injected with the blood of the patient who died, was unaffected. The other epidemic occurred in November; a man aged 50 who had had an apparently healthy parrot for some time, died from pneumonia Hegler considers that this was a case of psittacosis and that four members of the staff and a patient of the hospital who developed pneumonia were infected by contact with him; two died. Guenter described eight cases of pneumonia which were treated at Altona Hospital, near Hamburg. In two investigated cases the bacteriological examination was negative. Five patients had contact with sick parrots, and Guenter tries to connect them with three others in which contact with a parrot could not be proved; they were a male attendant, a nurse, and a house physician of the hospital where the patients were treated A healthy young parrot was inoculated with the blood of the sick nurse and died three days later from gastro-enteritis with lesions of the liver and spleen. Allard mentioned an outbreak in which six persons became ill with pneumonia and two died, the sick parrot also succumbed The number of cases of psittacosis in Hamburg was about thirty, with six deaths. Among these cases, paratyphoid bacilh were only once isolated from a parrot Siegmund

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be transmitted by a human being, though this has been claimed by Guenter, Hegler and others The occurrence of such cases can be explained by noting that epidemics of pneumonia have occurred without contact with either parrots or people suffering from psittacosis.

- (5) There is not any evidence that parrots are infected by human beings, though they may contract human tuberculosis. In nearly all the cases investigated, the parrot became ill or died first. In a few cases, the parrots remained apparently healthy
- (6) In considering measures for the prevention of psittacosis it should be borne in mind that in almost all epidemics recently imported South American parrots, which soon became ill and died, have been in contact with the patients. No case of psittacons has been reported among workers at Zoological Gardens, but they are not rare among workers in shops dealing with these birds Further investigations are necessary to show whether or not apparently healthy parrots can be the source of infection with psittacosis It seems unnecessarily stringent to destroy healthy parrots A quarantine lasting many months is, however, most essential, though the surest prevention would be not to keep them Those who have them should take all precautions against possible infection; they should use gloves, mild antiseptics and observe extreme cleanliness

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appears to be another case of pattacosis. The incubation period was less than two weeks, and the patient had been in close contact with the parrot while it was ill.

CONCLUSIONS.

- (1) The most characteristic clinical features of the disease are pneumonia, usually atypical, absence of sputum, cough, splenic enlargement and of rigors, the general state is that of typhoid fever with delirium, bradycardia, and fall of temperature by lysis, but without rose spots. The incubation period is from 2 to 14 days. Cases recorded as pattacosis solely on the ground of contact with a sick parrot, without the presence of pneumonia must be regarded as extremely doubtful. The mortality is high, varying with age and constitution.
- (2) From most cases streptococci, diplococci and staphylococci have been isolated; a few cases yielded Bacillus proteus. These may be present at the same time as a filtrable virus
- (3) Nocard's bacillus was obtained from the blood of a patient by Gilbert and Fournier; and in two cases in Hanover, in 1908 Nocard, Perry and others found it in parrots. Nocard's bacillus belongs to the paratyphoid group (B aertrycke, B enteritidis Gaeriner) and is frequently found in human beings, and in exceptional cases in their sputum, animals and birds (See Uhlenhut, Hubener, and Stolkind, who give the clinical features) Nocard's bacillus cannot, therefore, be the cause of psittacosis in human beings. The same may be said of streptococci. At present there is not any bacteriological or serological proof that human beings can be infected by parrots, and further research is necessary to discover the true cause of this disease.
- (4) I have not been able to find any case of psittacosis in which the infection was satisfactorily proved to

Painful Feet.

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AINFUL feet may be due to such obvious causes as hammer toes, hallux valgus, corns and callosities Treatment of these conditions will cause disappearance of the pain. There is, however, another and larger group of patients in whom no anatomical cause of pain can be found, unless it be a suspected alteration in what are called the "arches of the foot". It is the treatment of such patients that concerns us here.

The picture is familiar enough. The patient, who may be of either sex, complains of pain somewhere along the inner border of the foot Its severity varies from a slight ache to one which disables by its intensity There is nothing constant in the times at which the pain is worst, and the patient is by no means always able to account for it by changes in occupation or weight-bearing. The foot itself shows no real abnormality, one or more tender spots may be discovered, but their situation is not the same in all There may be some rigidity, but nothing like the spasm which characterizes "spasmodic flat No doubt some would say "the arch is low," but others would pronounce it normal, and there is no criterion by which we may judge between the two A painful foot may appear perfectly ordinary and yet be a perpetual source of discomfort to its owner. The patient is less concerned with nomenclature than with treatment, and we shall offend nobody's susceptibilities if we say that he is suffering from footstrain

Though the picture is familiar, it does not mean the same to all observers, and we must stop to consider some facts which receive little notice, though they are com-

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PAINFUL FEET

followed, and the foot has taken charge of the muscles which formerly controlled it Pain is caused by stretching of these contracted ligaments and muscles, and the causes of this are the causes of so-called flat foot, viz.: standing for long periods, debility, increase in weight or occupations which entail the carrying of heavy loads. A short tendo Achillis may induce changes in the foot, and mid-tarsal abduction may become obvious. It is, however, the tight, soft structures in the sole of the foot which are primarily at fault; and though abduction may be commoner than true "dropping of the arch," treatment must first be directed to the stretching of these contracted muscles and ligaments

A preliminary X-ray examination is usually necessary to exclude conditions which will not benefit and may be harmed by manipulation. Chief of these are tubercle and the severe forms of tarsal arthritis which are frequent in the elderly.

If the X-ray appearances are normal, or merely show evidence of a mild arthritis, we can proceed with treatment which aims at joint mobility and muscular adequacy.—

- (I) By restoring the foot to its normal suppleness
- (2) By training the muscles to become once more capable of taking charge of the foot
- (1) Manipulation. Full muscular relaxation is necessary, and this can only be obtained with a general anæsthetic. Gas-oxygen-ether gives rapid induction, deep anæsthesia and a quick recovery. The patient is placed flat on his back on a firm table, and the surgeon stands at his feet. Each foot in turn is forcibly put through a full range of movement, which includes manipulation against the longitudinal arch. Both hands are required for each foot, and there is no mystery about the process, but it must be vigorous and systematic. These forced movements often elicit

mon knowledge. We know, for instance, that completely flat feet are often quite painless. The headwaiter, the master-barber and the superannuated porter, though they may in younger days have passed through a painful phase, can shuffle through their later years in comfort if not in elegance. Again, we know that babies, anthropoid apes, native races and ballet dancers have feet which are as flat as your hand and yet are painless.

We cannot deny that most people have arched feet, but it seems clear that these arches are not essential to comfort. The opposite is often true: witness the foot which is beginning to flatten but has not yet become flat. Such cases are common, and are characterized by pain which persists until the foot has become still more flat.

The assumption that the arches of the foot are normal to man rests upon arguments which could be used with almost equal force to prove that corns and a beardless face are amongst our natural attributes.

The expression "as flat as your hand" should have made us pause. Our hands are indeed flat, and yet we can scarcely move them without producing arches which completely surpass those of any foot. These arches of the hand, however, depend entirely on muscles and not at all on ligaments; they are, in short, plastic arches. This brings us back to the ballet dancer whose muscles are so beautifully trained and whose foot so naturally supple that her "arches" flicker up and down like summer lightning. Her foot is like a hand in so far as its shape is controlled by its muscles and not by its ligaments. Fixed arches are false gods!

The feet which we have to treat are very different Confinement in boots and restriction of movement has induced rigidity and muscular atrophy. Secondary contracture of the soft structures of the sole has

Diagnosis in Gynæcology.

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HREE things may be said in the first place about diagnosis in gynecology. (1) It requires special practice and experience if it is to be of value; (2) it must be thorough, (3) the physiological condition of pregnancy may complicate the diagnosis, or it may have to be excluded before a proper diagnosis is made

There seems to be little doubt but that the majority of general practitioners have not had sufficient experience in the methods of examination required, and therefore they lack confidence in coming to a decision. Also, there may be a feeling of mutual delicacy and sensitiveness between the patient and the family doctor which tends to lead to delay in arranging for an examination or to an imperfect and incomplete This is quite a natural and, in a sense, examination a praiseworthy feeling But it is entirely wrong from the scientific standpoint and is very much against the patient's best interests If sensitiveness for the patient's feelings or lack of confidence on the part of the doctor stand in the way, then the patient should be referred to someone fully conversant with the subject.

Diagnosis is not usually made sufficiently clear merely as the result of a bi-manual examination. It must be remembered, too, that in aiming at a gynæcological diagnosis, one must think beyond gynæcology and beyond the pelvis. For example, if there is pain in the back, it is obviously reasonable to look at the back and test the spine for rigidity, tenderness,

"cracks" which may be heard and felt, but success does not depend on their occurrence, nor can it be measured by their volume

(2) After-treatment should begin the same day. The first application may be gentle, and should consist of radiant heat massage and movement. Thereafter, the patient should have daily and vigorous manipulation to keep the feet supple, and exercises to train and strengthen the muscles which act upon them. Much depends on the masseur, and he must be carefully instructed. Rest is unnecessary and harmful. Use of the foot must be encouraged from the outset Post-operative pain, though uncommon, will soon yield to massage and use of the hmb.

Patients vary in their speed of recovery, but there need be little or no interference with ordinary life, provided that treatment can be given daily for a week or two. Comfort is the goal of treatment, and, when once this has been regained, all that is required to ensure permanent relief is: (1) Maintenance of muscular adequacy, and (2) Maintenance of mobility of the foot.

Suitable exercises are prescribed, and the patient performs these for a few minutes daily. Boots and shoes must not cramp his feet or restrict movement. He is the best judge of what constitutes comfortable shoes, and he should be allowed to choose them for himself, providing such choice conforms broadly with the surgeon's ideas of his requirements.

The views here expressed are largely those of Mr. Blundell Bankart, in whose precept and practice the writer found light on a dark subject

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have been brought on by any special circumstance, e.g. labour Note the patient's general appearance as to pallor, cyanosis, nutrition, and so forth Also note any sign of mental peculiarity.

Examination—It is very important to gain the patient's confidence. This is not usually difficult. One is often astonished at the complete trust which patients have in their medical advisers, and this should surely put us on our mettle to play up to that trust and give of our best

In order that the examination may be thorough, it is important that it shall be properly staged. In other words, the conditions must be such as to make it possible to have a complete and detailed examination under the best conditions available. A nursing home or hospital theatre may be the ideal, but that is by no means always to be had.

It is often better to examine the patient in bed in her own house rather than in the consulting room. The general requirements are well-fitting rubber gloves, a lubricant, lysol and warm water, good light, as well as some special equipment such as speculum, vulsellum, and sound

Abdominal Examination —Always start by examining the abdomen, and be sure that the hands are warm Cold hands are very unpleasant when applied to a warm abdomen But more important than the discomfort is the fact that they make the abdominal muscles contract and so interfere with proper palpation

That all things be done decently and in order is a good rule in the case of clinical observations as in other matters. Therefore a certain amount of routine, with reasonable elasticity, is desirable. That being so, it is well to keep in mind the four ordinary methods in the following order. Inspection, palpation, percussion, and auscultation. There is no need here to go into

and so forth.

No pretence is made in this paper of doing much more than to indicate, in general terms, how to come to a diagnosis and give certain guiding rules which may prove helpful.

Anatomy - Without going into details, a few anatomical points are necessary Anatomical descriptions refer to the subject standing erect. The normal uninjured cervix is bluntly conical and of firm consistence It points downwards and backwards The uterine body points upwards and forwards. The angle between the cervix and the anterior surface of the body of the uterus is widely obtuse The cavity of the uterus measures 21 in from the external os to the fundus as estimated by the sound In the anterior formx the bladder intervenes between the examining fingers (bi-manual). In the posterior forms the rectum and pouch of Douglas can be palpated. In the lateral fornices the ovaries may be felt, as also the Fallopian tubes and, may be, the round ligaments I am convinced that it is a fallacy to say that a palpable Fallopian tube is necessarily a thickened one. A great deal depends on the state of the abdominal wall, e.g fat or muscular rigidity.

Methods of Examination —After asking the patient what she complains of, in her own words, and recording her complaints, proceed to investigate briefly, but sufficiently, the history of the case. Inquire as to past pregnancies and abortions, noting their dates and special characteristics. Go carefully into the menstrual history from the point of view of regularity, frequency, duration, amount of loss, passage of clots, pain (preor intra-menstrual), menopause, and post-menopausal bleeding. The patient's age must be ascertained, as this is often important in dealing with gynæcological conditions, especially hæmorrhages. Find out the duration of the present trouble and whether it seems to

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be referred to later.

- (2) Employ two fingers, index and middle, when possible
- (3) Be ambidextrous It is often of great value to examine the patient's left forms with the fingers of the left hand. If the patient is lying in bed, the doctor must cross to her left side to make such an examination. If in the lithotomy position, obviously no change of stance is required.
- (4) If the vagina is narrow, or if there is a spasm of the sphincter vaginæ, insert only the index finger.
- (5) If only the index finger can be employed, as in No. 4, it is often of the greatest help to insert the middle finger into the rectum. This allows a much wider range of exploration. The recto-vaginal septum is thus in between the index and middle fingers of the examining hand. In other words, this is a recto-vaginal digital examination.
- (6) Remember the enormous help a general anæsthetic may give.
- (7) A virgin should rarely be examined vaginally without a general anæsthetic
- (8) Do not under-estimate the value of tenderness on pressure as a guide to diagnosis and treatment. If pain is complained of, examine first of all without an anæsthetic so as to localize the site of the pain and to judge of its type and severity. Then, if necessary, an anæsthetic may be given for the sake of making a more accurate and thorough estimate of the state of the pelvic organs.
- (9) The ideal position for making a vaginal examination is the lithotomy position. This especially applies when a speculum is to be employed.
- (10) Never forget to exclude the presence of an over-distended bladder in cases of abdominal swelling Retention of urine with overflow incontinence often go

these matters in detail, but a few points may be referred to Any obvious swelling will at once be noted A central supra-pubic swelling may suggest pregnancy, whilst irregularity of the swelling with, possibly, some lateralization, would be likely to make the presence of a tumour of some sort more probable. Abdominal wall movements must be studied In a case with acute symptoms, blueness of the umbilicus would put one on one's guard against missing a ruptured ectopic pregnancy.

On discovering localized tenderness with, probably, some muscular rigidity, it is well to test for cutaneous hyperæsthesia in order to try to localize the spinal reflex are level and thus find a clue as to the viscus affected. In using this test, a good deal depends upon the intelligence of the patient.

Palpation is very important and must be carried out firmly and gently, avoiding all prodding with the finger-tips. If a swelling is found, its extent and consistency should be gauged, testing for fluctuation or hardness, mobility or fixity

Auscultation is sometimes helpful, especially in cases of general peritonitis, because of the absence of peristaltic sounds when the bowel is paretic, as is usually the case in this condition. If pregnancy is suspected, the fœtal heart should be listened for, if considered sufficiently advanced. Absence of fœtal heart sounds does not exclude pregnancy

Vaginal Examination —This includes palpation and vision. I wish most strongly to urge the advantage of making all vaginal examinations in the dorsal position, unless for some special reason to the contrary in any particular case. One can thus much more thoroughly explore the pelvis than when the lateral position is adopted The following points will be found worth careful consideration:

(1) Explore per vaginam systematically. This will

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practice and experience can interpret what is to be found by touch and sight. Frequently one must decide whether a swelling is of an intra-peritoneal or of an extra-peritoneal cellulitic type. If the latter, it is important to estimate whether pus has formed or not. Such questions are often very difficult to answer, but practice will gradually lessen the number of mistakes made, provided the examinations are carried out with due care and completeness

Pus may be required for bacteriological examination If the gonococcus is to be sought for, it is usually of little value to take a smear from the vaginal pus A drop of pus should be taken from the urethra, after milking out what pus there may be in its lumen and in its gland crypts, and from the cervical canal taking the pus from the latter, care must be taken to have it free from blood Therefore a vulsellum should not be used If the os cannot be seen properly, a useful manœuvre is to push the bladder upwards with a blunt instrument, and this will tend to rotate the cervix forward, bringing the os into direct view. A negative finding does not necessarily mean that the condition did not originate as a gonococcal infection If gonococcus is suspected, repeated examinations should be made if the first ones are negative

Prominent Symptoms in Gynæcology—(1) Hæmorrhages. These will be briefly dealt with later.

- (2) Discharges These may be excess of normal vaginal secretion, pathological purulent discharge, or blood-stained discharge
 - (3) Pain—local or referred.
- (4) Disturbances of micturation, associated frequently with a definite gynecological condition.
 - (5) Dyspareunia
 - (6) Sterility.
 - (7) Swellings, inflammatory or neoplastic.
 - (8) Procidentia

together.

(11) Beware of being misled by the presence of faces in the rectum. Their presence must be proved or excluded An enema is often invaluable prior to a vaginal examination.

Systematic Bi-manual Vaginal Examination.—As has been suggested already, it is well to adopt a routine in examining patients so that there may be the less risk of missing any relevant signs. In making a vaginal examination, both visual and tactile, the reasonable method is to note all characteristics from without inwards. Thus in doing a bi-manual examination such points as the following should be noted, starting from the vulva and proceeding inwards:

- (1) Swelling or tenderness about the labia.
- (2) The state of the urethral meatus.
- (3) The condition of the hymen.
- (4) Spasm of the sphincter vaginæ.
- (5) The state of the vaginal walls, e.g. laxity, induration, inflammation.
- (6) The presence of discharge, purulent or blood-stained.
- (7) The cervix uteri—size, shape, direction, consistence, regularity or otherwise, friability, state of the os, erosion, and tendency to bleed easily.
- (8) The uterus—position, size, shape, consistency, mobility.
 - (9) The formces—swelling, induration, fluctuation.
- (10) All through the examination, attention must be paid to tenderness—its degree, localization, variability in site or intensity.

It is very necessary to be familiar with the use of the speculum, the vulsellum, and the sound. Visually, much may be learned For example, blueness of the cervix may give a hint as to the possibility of pregnancy, cancers may be suspected or diagnosed, the origin of discharges may be investigated. Only

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cavity of the uterus and subject the scrapings to microscopic investigation. This, in the case of non-malignant conditions, may often lead to cure. Thus a diagnostic curettage will many a time be also a therapeutic curettage. This procedure is scientific and practical. If cure is not effected by the curettage, then some other method of treatment must be tried, and this may be some form of radiation. But the point is that curettage or the removal of a wedge are the necessary preliminaries for the sake of diagnosis in such cases, and diagnosis is of the utmost importance

Fibroids, associated with symptoms, must be treated by the approved methods The possibility of associated malignancy should be borne in mind

The above remarks are for the most part general and indicative Other points might be raised, and those already mentioned might be elaborated further, but sufficient has been said at least to impress the broad principles

It would seem to be the case that a vast number of women take for granted that certain bodily ailments must be borne as the price to be paid for reproducing their kind. This may be so up to a point, but, when symptoms are present they should be investigated. There is no doubt that many women could be relieved or cured of their pelvic disabilities, major or minor, if they would but submit to timely examination.

Again, one must emphasize the need for thoroughness in examination. The female pelvis is accessible and, in a large proportion of cases, a reasonably exact diagnosis can be made if proper methods are employed.

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A few words must now be said on the very important subject of gynæcological hæmorrhage. An effort should be made in all suspected cases to exclude or prove the presence of cancer. Four points should be noted about uterine cancer:—

- (1) It may appear before the age of thirty in the cervix
- (2) It may be fairly well advanced before symptoms appear.
 - (3) Pain tends to be a late symptom
- (4) Wasting does not usually become evident till the disease is far advanced

Thus the disease may go on insidiously, and its presence may not be suspected till the early stage is well past. All cases of pathological uterme hæmorrhage should be subjected to an exhaustive examination

One cannot too strongly condemn as thoroughly unsafe and unscientific the practice of sending patients complaining of hæmorrhage first of all to the radiographer instead of to the gynæcologist Such a patient may be suffering from a turbulent menopause, and she may be cured by radiation But how can it be certain that such is the condition? Is diagnosis to be made according as treatment is successful or not? This is surely the wrong order. The result may, in many cases, be satisfactory to the patient, but every now and then a serious mistake will be made and a cancer will be missed with the loss of time to the patient and, consequently, a poorer prognosis when the proper treatment comes to be applied. It is always wrong to choose the blind and ignorant way when light and truth are available A scientific diagnosis can nearly always be made for or against the presence of cervical or endometical cancer

If the cervix is suspected, cut out a wedge and have it examined by an expert pathologist. If the endometrium is at fault, dilate the cervix and curette the

better than the Jacques soft rubber variety. For abnormal cases gum elastic catheters with tapered olive, coudé, and bicoudé tips should be available. One of the two tapered gum elastic bougies, No. 8-10 English, should also be at hand because in cases of stricture it is often easier to pass a solid tapered bougie than a catheter of similar form. This procedure will often enable the sufferer to pass his water after the appliance is withdrawn. There are many other types of instrument, which a urologist uses in difficult cases, but for routine work the above few types will be sufficient Metal appliances should only be used with the greatest care and judgment. injuries are frequent, easily caused by their use, and the subsequent treatment of the case may thereby be made one of great difficulty.

We must now consider the technique of catheter-First there is the care of the catheters. etc All the types mentioned above can now be obtained made of materials which will stand boiling so that the question of asepsis really ceases to bother one Care should be taken to see that the channels through the catheters are open because nothing is more annoying to both surgeon and patient than to find that, after a difficult catheterization has at last been accomplished, the urine will not flow out because the passage through the appliance is blocked. This can be avoided by remembering to force a little water from a syringe through the catheter immediately after use so as to remove any pus or blood which may have lodged therein. Catheters when clean should be wiped and hung suspended by one end to drain and dry their interiors before being put away. Drops of fluid left in the channels tend to set up erosion of the interior surface which is hable to cause blocking. Gum elastic appliances should not be too stuff and,

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Catheterization.

BY H L ATTWATER, M.A., M.CH, FRCS

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HE procedure of passing a catheter in the male, though usually simple, may occasionally require considerable perseverance and skill. Moreover, the patient frequently delays sending for help so that we are often asked to perform this operation at the end of the day when fatigue is apt to magnify our difficulties. Consequently this manipulation is sometimes regarded as a bugbear, and the risk of failure makes many practitioners regard catheterization as a nuisance to be avoided if possible. It is the purpose of this article to give a few principles and hints which may be helpful in cases of difficulty.

There are two important essentials when using any form of urethral appliance which must always be borne in mind and which cannot be emphasized too strongly. The first is gentleness and the second is cleanliness. Much harm can be done in a few moments either by the clumsy use of a catheter or by the introduction of virulent organisms on a non-sterile instrument. Careful technique will, however, insure that our instruments are sterile and will prevent us from doing harm

Before pursuing this part of the subject further it is desirable to mention the instruments necessary for success in most cases. For anyone but an expert urologist it is quite unnecessary to provide more than two sizes of catheter; for ordinary purposes a No. 8 or No. 10 English and a No. 3 or No. 5 English will suffice. With regard to the type of catheter required for normal cases nothing is

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penis carefully cleansed by swabbing with an antiseptic solution. If there is any urethritis, or if circumstances appear to warrant extra care, the anterior urethra should be irrigated with a weak solution of germicide. This may be done by repeatedly distending the urethra with the fluid and allowing it to escape, or by using a two-way urethral nozzle, which is designed for the purpose, and flushing the channel from a tank or syringe. If the above anæsthetic is used the chloretone goes far to fulfil the purpose of cleansing the anterior urethra

When all is ready, the patient, who should be recumbent with a sterile towel across the thighs, should relax as much as possible. The operator then grasps the penis behind the corona and introduces the tip of a well lubricated catheter within the meatus and pushes it in bit by bit until it finds its way into the bladder. With regard to lubrication, sterile olive oil is good but is rather messy and favours the growth of organisms. Some of the proprietary catheter lubricants, which are water soluble jelly-like substances and are usually made up with a small amount of antiseptic, are supplied in collapsible tubes and are safe and handy to use

The above procedure is all that is required in normal cases Occasionally, however, even in this class certain difficulties are met with when attempting to introduce these appliances, and abnormalities may make this otherwise trivial operation one of great difficulty. Extreme phimosis or a contraction of the external meatus is comparatively common and may cause considerable resistance to the passing of an ordinary sized appliance Circumcision and meatotomy are the obvious remedies for these conditions but, unless they are causing local and general symptoms, such proceedings can hardly be advised for the purpose of collecting a sample of urine.

if they have become so by keeping, immersion in hot water immediately before use will restore their phability

The next point to be considered is the use of an anæsthetic for the passing of a catheter who have been catheterized on many occasions may need no such help; whilst the exceedingly nervous and those with marked spasm of the urethra and bladder may occasionally require a general anæsthetic. In the majority of cases, however, it is advantageous to use an efficient local anæsthetic. The capacity of the anterior urethra in most males is about one drachm, so that, if this quantity of anæsthetizing fluid be injected through the external meatus, retained by a clamp and added to from time to time, at intervals of from three to five minutes, as the solution leaks away through the posterior urethra and until a total amount of half an ounce of the solution has been used, good anæsthesia of the canal will result By this means all ordinary manipulations, such as catheterization, will be greatly On an experience based on facilitated thousands of cases, the best solution to use for this purpose is -

> Cocame hydrochloride - - ½ per cent Sodium bicarbonate - - - ½ In chloretone water - - - ½ ,,,

Owing to the low percentage of cocaine no illeffects ever occur and, if properly given, its anæsthetizing power is superior to all the other solutions I have as yet tried

We will first consider the method of passing a catheter in normal individuals. As a rule an ordinary soft catheter, about 8-10 English, passes readily. It should be boiled and laid in a tray of boric, or weak mercury oxycyanide solution (1/8000). The prepuce is retracted and the meatus and glans

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under strong tension If this pressure is maintained, usually after a few moments, the catheter will glide forwards and pass into the bladder. In rare cases, if the above manœuvres fail, a light, general anæsthetic may be given when all difficulty will cease

A word must be said about the precautions necessary to prevent ill-effects after catheterization. As has been said above, extreme gentleness in all manipulations and asepsis are essential. If after catheterization is completed, a small quantity (3-4 ounces) of mild antiseptic be introduced through the catheter into the bladder and left there, evil aftereffects will be rare. If instrumentation has been troublesome, about one drachm of ½ per cent. silver nitrate solution may be introduced into the urethra and massaged back into the posterior channel. Either method is useful in preventing the bad effects of catheterization.

We must now consider the catheterization of cases which, owing to abnormalities of the urethra, such as the presence of a stricture or of an enlarged prostate, present special difficulties to the introduction of urethral appliances Congenital strictures due to valve-like flaps of urethral mucosa, are uncommon and are unlikely to hamper us except on rare occasions In prostatic cases the difficulty is usually due to the prolongation of the posterior urethra backwards and upwards into the bladder and by the enlargement of the posterior or middle lobe of the gland The key to the successful passage of instruments is to make their tips hug the anterior wall of the urethra. Catheters with coudé or the more exaggerated bicoudé beaks are designed for this purpose Should these fail, success may often be gained by a simple manœuvre A soft No. 8 rubber catheter is threaded over a wire stilet made of fairly strong gauged wire, the end of which is

In cases of phimosis, before passing a catheter, the prepuce should be washed out by distending it gently several times with a weak antiseptic solution from a syringe It is generally possible to stretch the constricted preputial orifice a little and, by manipulation, to see the external meatus through it. Sometimes this is impossible, and it is then best to use an olive-tipped gum elastic catheter, and to probe for the opening of the urethra on the glans through the preputial onfice. This is not difficult if the anatomical location of the external meatus is borne in mind. Having introduced the tip of the catheter the rest of the operation proceeds in the usual manner. If the external meatus is so small as to prevent the passing of the small sized appliances mentioned above, meatotomy should be advised because such a constriction is sufficient to cause a moderate degree of back pressure, which is detrimental to the health of the patient.

Another difficulty which may be met with, is spasm of the compressor urethræ muscle which may sometimes make the passage of a catheter a task of great difficulty. Every effort should be made to get the patient to relax both in body and mind. His position should be as comfortable as possible and every care should be taken to cause no pain, because twinges of pain, or even discomfort, will only increase and intensify the spasm An olivetipped gum elastic catheter should be warmed in hot water to render it pliable, lubricated, and introduced The penis should be strongly pulled upon in the direction of its length, giving lateral support to the catheter and keeping it in the line of the urethra As soon as the contracted muscle is felt, gentle pressure should be put on the catheter and maintained. Nothing like force should be used but mild pressure will cause no harm if the penis is

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by the bougie, has had time to settle back into its old irregular form. The use of "guides" in cases of really small stricture of the urethra is highly technical and beyond the scope of this article.

Nothing has been said above about metal instruments. The large sizes have a limited use but the small ones, such as are required for tight and difficult strictures, are dangerous and should only be employed by those who are really expert in the use of urethral apphances

Finally, a few words about the reactions which may occur in such cases after catheterization All that has been said already about normal cases applies still more to the abnormal ones In addition, when severe retention of urme is present, the bladder being tense and much distended, no attempt should be made, especially in prostatic cases, to evacuate the urme suddenly through a large catheter. The water should be allowed to drip away through as small a catheter as possible, otherwise sudden evacuation may set up a reflex congestion not only of the bladder but also of the kidneys, and death may follow. If for any reason a large catheter 18 passed the outflow should be obstructed so that the urme can only leak away slowly. In the event of catheter fever the patient should be put to bed on a fluid diet, free diuresis with alkalis and diuretic waters should be promoted, and a brisk purge should be given Pyrexia usually only lasts a short while, but should never be neglected especially if the renal function is deficient as is often the case prevention of the other reactions after catheterization follows the same lines as those already mentioned for the normal cases

bent back on itself in a wide sweep so as to form a nearly semicircular hook, 2 to 3 inches across. This hook-like appliance, with the eye of the catheter at its tip, is a rather awkward instrument to negotiate through the anterior urethra, but careful manipulation will accomplish this, when it will slide easily into the bladder

In stricture cases the procedure is somewhat different In these the canal is constricted and obstructed by scar tissue and may be irregular in direction. Furthermore, loose cedematous may choke the lumen of the constricted channel and cause further obstruction by catching in the tips of the instruments. A soft catheter is often useless in these cases, but the olive-tipped appliances will frequently pass under good local anæsthesia If the catheter cannot be introduced, success may follow the use of a fine phable bougie When such is used for this purpose it is passed until its tip rests against the face of the stricture when gentle probing movements are made combined with a rotation of the long axis of the shaft. As soon as the tip is felt to engage in the lumen of the stricture it will pass onwards and, unless it encounters further obstruction, will enter the bladder If other obstructions are met the process is repeated. The bougie being tapered should be passed until its full calibre has threaded the stricture which can usually be done with a No 4-5 English bougie Exceptional cases of extremely narrow stenosis require other methods of a rather more technical nature than can be discussed here When the bougie has been passed and removed, the patient can usually pass his water naturally, if he makes the attempt gently without straining If not, the bougie should be reintroduced, removed, and a fine olive-tipped catheter passed at once before the canal, straightened

that exfoliative dermatitis was due to the salvarsan, so that many theories were devised to account for its appearance. There is now a consensus of opinion that the skin eruptions are a direct result of arsenic, but that there are other accessory factors and that personal idiosyncrasy plays an important rôle. Lees and Stokes and Cathcart⁵ have written excellent summaries of the various theories accounting for arsenical dermatitis, and the following causes are mostly taken from their classifications.

(1) BACTERIAL.

- (a) Contamination of Solution—Muller⁶ suggested that the skin lesions were produced by the presence of living or dead micro-organisms in the solutions of arsenic administered
- (b) Jarisch-Herxheimer reaction —Pinkus⁷ thought that the destruction of the spirochætes by arsenic set free toxins which caused a general intoxication with cutaneous hyperæmia
- (c) Infection Theory.—Wechselmann⁸ attributed the skin lesions and associated conjunctivitis as infectious diseases taking a peculiar course owing to the arsenic, later, he⁹ considered that there was an analogy between them and serum disease as described by von Pirquet and Schick. Milian¹⁰ distinguished between the early erythematous rash and the late or true exfoliative dermatitis. The latter he thought was due to arsenic, and the former to an intercurrent infectious disease such as rubella or scarlatina. Later, Milian¹¹ restated his view saying that arsenic has a provocative effect on a latent infection similar to mercury on Vincent's symbiosis
- (2) ARSENICAL INTOXICATION.
- (a) Vasculo-toxicity of Arsenic.—It was recognized by Pistorius¹² that arsenic has a vasculo-dilatory effect Possibly, arsenical dermatitis is due to an exaggeration of this action.

Arsenical Dermatitis During Anti-Syphilitic Treatment.

By A MICHAEL CRITCHLEY, M.D.

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N the large venereal clinics and Army treatment centres the incidence of arsenical intolerance is small. Thus Lees¹ reported 10 severe cases only of arsenical dermatitis in 4,500 cases treated with arsphenamme. Parnall and Fildes² in 1.250 cases found 3 per cent developed skin lesions Harrison³ with 39,372 cases found 0 9 per cent (370 cases) had skin affections and that 0 045 per cent. (18 cases) were fatal These figures are very favourable but, unfortunately, the incidence of arsenical dermatitis is much greater than the statistics of Harrison and of Parnell and Fildes, for these observers were dealing with able-bodied young men, who were kept under constant medical supervision during treatment. civil life the patients are of all ages, physique and fitness, and their lives cannot be so surely regulated as in the Services

VIEWS AS TO THE CAUSATION OF ARSENICAL DERMATITIS.

Although it was well-known that arsenical poisoning often produced cutaneous lesions, as Brooke and Roberts⁴ described cases in the arsenical beer poisoning epidemic of 1901, it was not recognized

ARSENICAL DERMATITIS

Keidal²⁰ have studied the work of Auer²¹ on the mechanism of local reaction in various tissues following sensitization by a foreign protein, and have applied his sensitivity theory as to the cause of arsenical dermatitis These workers consider that either arsenic or some bacterial proteins from a focus of infection become sensitizing agents, and the action of arsenic, which is vasculo-toxic, on this sensitized substrate is to produce inflammation. Stokes and Cathcart also believe that the presence of focal sepsis increases the susceptibility, and it is also their opinion that various dermatoses, especially seborrhoeic, render the skin more hable to dermatitis. McDonagh²² finds that most cases with arsenical dermatitis suffer simultaneously with intestinal toxemia and that if this stasis is properly treated the cutaneous lesions rapidly get well.

(5) NERVOUS THEORIES

Lees noticed that most of his patients with exfoliative dermatitis were of nervous temperament and that many cases were complicated by peripheral neuritis, so that it is possible that nervous mechanism plays a part in this disease

CLINICAL COURSE OF ABSENICAL DERMATITIS.

The first effect of the arsenic administered is generalized erythema caused by the dilation of the cutaneous blood vessels. This vaso-dilatation leads to ædema of the skin. Later, the superficial dermis exudes, and finally becomes shed

Prodromal Stage — Milian²³ divides the signs of arsenical intolerance into mild and grave

(a) Mild—Subjective sensation of taste or smell resembling garlic Hypersecretion of certain glands, especially the lachrymal Increased intestinal secretion causing diarrhoe Excessive secretion of the choroid plexus, producing severe headache "Nitritoid

- (b) Damage to the Suprarenals—Browne and Pearce¹³ found at autopsies on fatal cases of arsenical dermatitis the adrenals were damaged and suggest that it was this injury to the suprarenal glands brought on by the arsenic, that caused the skin lesions. The damage to these organs hinders the action of adrenalin, which counteracts the vasculo-toxicity of the arsenic
- (c) Renal damage—Schamberg¹⁴ considered that when mercury was simultaneously administered with arsenic, the kidneys were damaged, resulting in an inability to excrete arsenic so that it was retained, causing these cutaneous manifestations of retention Numerous cases, however, are on record in which no mercury has been given
- (d) Metallic Over-oxidization —Over-oxidization of the tissues by arsenic is considered by McDonagh¹⁵ to be the essential factor in arsenical dermatitis and led to his introduction of intramine, and its successor, contramine
- (e) Thyroid Changes—Sramek¹⁸ thinks the skin changes are from arsenical damage to the thyroid, and quotes cases which recovered under treatment with thyroid extract

(3) HEPATOTOXIO

- (a) Syphilitic Injury to the Liver —Syphilitic hepatitis producing inability to metabolize arsenic is propounded by Glombitze¹⁷ as basis of the skin lesions
- (b) Damaged "Proteopexic" Function —Widal¹⁸ believes that arsenic, by damaging the proteopexic function of the liver, produces various anaphylactic phenomena

(4) ANAPHYLACTIC THEORIES

- (a) "Colloidoclasic Crises"—Widal, Abrami and Brissaud¹⁹ suggest that the exanthems, following the initial arsenical injection, are manifestations of a so-called "colloidoclasic crisis"
 - (b) Sensitivity or Allergic Instability -Moore and

ARSENICAL DERMATITIS

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crises," with swelling and congestion of the face, etc. Slowing of pulse Prolonged vomiting, rigor or pyrexia. Buzzing in the ears. Erythema, pruritus, pains in back Recurrence of the above signs of intolerance with succeeding injections

(b) Grave.—Persistent vomiting. Scarlatiniform erythema. Jaundice.

Steard and Roger²⁴ consider absent tendo Achillis jerks with erythema to be ominous and mention that in cases of arsenical intoxication a patch of erythema is provoked by the application of iodine to the skin. According to Lees, herpes labialis is a prodromal sign.

The Eruption.—As a rule, the first sign of true dermatitis is an erythema on the backs of the wrists and ulnar side of forearms, which very rapidly becomes generalized. There is often an associated conjunctivitis with pharyngitis and sometimes laryngitis. The face may become very ædematous, so that the patient may be unable to open his eyes. The temperature is usually between 100° and 104°F., and the pulse is regular and strong, whilst the general health is fair. Moderate leucocytosis with sometimes an eosinophilia is the rule erythema then passes into a vesicular stage, which is quite likely to become pustular. The skin gets covered with scales which desquamate from the surface On the hands and feet the scales tend to be much coarser, and peel off in large keratotic plaques. The hair and nails may be shed. lesions are not indurated, and in the earlier stages may weep copiously. Points of pressure and of excessive moisture are very prone to develop secondary infection. The scales become more brawny, and the skin shows dark brownish-red pigmentation and finally dries and becomes atrophic and inelastic. There may be albuminuma. Convalescence and re-

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covery are slow, and boils and recurrences of the cutaneous lesions owing to sweating are common.

Complications—Broncho-pneumonia is the most common cause of death in cases of arsenical dermatitis. Peripheral neuritis of one or several nerves may complicate this disease. Interest and purpura are rare accompaniments or sequelæ

Clinical Pathology.—The Wassermann reaction becomes negative during the stage of active dermatitis. The blood shows leucocytosis and the eosinophilia may be 30-40 per cent, but in fatal cases it is said that the eosinophilia count diminishes. In the exfoliative stages arsenic can be demonstrated in the skin and urine.

TREATMENT.

Arsenical dermatitis is a preventable condition and should never occur in severe form. Prevention of severe dermatitis is brought about by the following:—

- (A) Prophylaxis—correct administration of arsenical compounds
- (B) Abortive treatment—recognition and treatment of the prodromal symptoms of arsenical intolerance

Prophylaxis —Before any arsenic is administered it is necessary to examine the patient thoroughly in order to ascertain whether or not he is physically fit enough to stand strenuous anti-syphilitic treatment. Special attention must be paid to age, sex, history of previous skin disease, kidney disease and any areas of focal sepsis

The initial dose must not be large, the exact amount depending upon the sex and weight of the patient. The drug employed must be of reliable manufacture and is to be given slowly with strict

aseptic technique

Milian²⁵ believes that before an injection of arsphenamine the preceding diet should aim at rendering the blood strong in basic substances so that the arsenic may not disturb the reaction of the blood. He therefore recommends a diet of milk and vegetables, with restriction of meat, fruit and acid salads. Other clinicians always precede an injection of arsenic by a draught of glucose in order to fill the liver cells with glycogen.

Abortive Treatment—This when applied to a case showing prodromal symptoms prevents the full development of arsenical intolerance and enables arsenical therapy to be continued under extra careful supervision. The main prodromal symptoms will be enumerated.—

- (1) Nausea, malaise and vomiting after an injection of arsphenamine
 - (2) Itching
 - (3) Erythema which is not a Herxheimer reaction
- (4) Papular rash on backs of wrists and ankles—this is the beginning of true arsenical dermatitis.

On the development of any of the above symptoms, arsenical and mercurial treatment should be stopped for at least seven days. Give contramine 0 125 gram intramuscularly on alternate days. If possible the patient should remain in bed. Lees recommends taking 10-20 c.c. of blood and giving sulphur gr xxx t.d.s. The bowels should be kept well open with saline purges or enemas, preferably "treacle enemas" (Black Jamaican treacle 9 ss., water 0 ss.)

Treatment—Rest in bed, with fruit diet, and treacle enema on alternate days—Contramine 0 125 gram every other day should be given, and often six doses will suffice—Sodium thiosulphate (ametox) is largely employed in combating arsenical as well as other metallic poisons, converting the toxic metals into non-toxic insoluble sulphides—Rayaut²⁶ was the first

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person to employ the drug in arsenical dermatitis. From personal observation it was found that boils often occurred in cases treated with ametox, whereas the cases in which contramine was employed had no boils. One patient treated with ametox returned six months later with intense jaundice in spite of the fact that no further arsenic had been given Lotio calamine is a good dressing in the early stages, but a favourite and very satisfactory application at the London Lock Hospital is the following prescription of McDonagh:—

B. Zinci oxidi 3 ii. Olei eucalypti 3 iv Olei olivæ \ aa ad 3 ii Aquæ calcis \

Later, oatmeal baths and ung. zinci are good in the exfoliative stages. Should boils develop, manganese butyrate 1 c.cm intramuscularly on two successive days generally aborts or cures this condition, but aggravates it if more than two injections are given. When convalescent the general condition should be improved by such tonics as iron and strychnine and oleum morrhuæ or collosal iodine 100 c.cm intravenously

In view of the fact that in many cases of arsenical dermatitis there is a focus of infection which may be a factor in its causation, it is necessary to consider whether or not to treat this focus. Stokes and Cathcart comment on this problem in the following words: "We advise against removing or stirring up any focus of infection during an attack of dermatitis, unless an unusually prolonged siege and chronic changes accompanied by an easily accessible, very septic focus, completely removable at a single operation, can be demonstrated. It is especially serious to undertake removal of teeth when an extension into inaccessible tissues or to other teeth

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as yet only slightly involved may aggravate the septic process instead of removing it, and have the most serious effect on the dermatitis . . Removal of a focus of infection can be accomplished after the dermatitis has completely subsided, with no ill-effect."

Many other methods of treating dermatitis have been introduced, amongst which are thyroid treatment by Sramek, and liver therapy by Spiethoff.²⁷

Influence of Arsenical Dermatitis on Syphilis.—The Wassermann reaction becomes negative during the attack of dermatitis and remains in this state for several months. This observation led Buschke and Freyman²⁸ and other workers to state that the patient's syphilis was cured. Other observers have since proved that this deduction was incorrect and that further antisyphilitic treatment was necessary.

Further Antisyphilitic Treatment -It is a difficult problem to decide when antisyphilitic therapy should be renewed and what drugs to employ. Each case must be considered individually for it is impossible to generalize or dogmatize Ffrench²⁹ believes that further treatment may be commenced during the convalescent period, but Lees thinks it madvisable to start so soon except in cases taken very early, an opinion which meets with general agreement Arsenic must not be used again in severe cases, but in cases in which dermatitis has been aborted, arsenic can be resumed if employed with very great caution arsenic is thus re-employed it is best to use one of the pentavalent arsphenamine compounds such as acetylarsan, which are less toxic than the trivalent prepara-In severe cases no attempt must be made at arsenical therapy, but treatment is to be continued with iodides, mercury and bismuth, and should not be too vigorous at first, as jaundice is very likely to

ARSENICAL DERMATITIS

supervene

Stuart and Maynard30 have studied the local reactions excited by intradermal injections of varying dilutions of arsenic. Dilutions of 1/1,000, 1/5,000, 1/2,500, and 1/12,500 were employed N/50 NaOH solution was used as a control 3-4 minims of the various strengths were injected into the superficial layers of the dermis In cases showing intolerance a firm elevated nodule appeared in the skin at the site of the injection after an interval of several days and increased in size until the tenth to the fourteenth day, after which it gradually disappeared Stuart and Maynard find that cutaneous hypersensitivity to arsenic occurs in patients who have suffered from exfoliative dermatitis and believe that this test may be of practical importance in determining whether or not treatment with arsenic can be employed

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Practical Notes.

The Treatment of Hernia of the Bladder.

C P G Wakeley observes that in a comparatively few cases only is a diagnosis of hernia of the bladder made prior to operation. these cases, and in all suspected cases, cystoscopy should be carried out before an operation for the cure of herma is performed cystitis should be treated by bladder irrigations. In by far the majority of cases the bladder hernia is only discovered during an operation for an inguinal or femoral herma. If due precaution was always taken to free the peritoneal sac from the surrounding structures, mury to an associated bladder herma would be a very rare accident. When a paraperitoneal hernia of the bladder is discovered during an operation, the treatment will vary according to the size of the bladder herma and its relation to the sac. If the hernia is small it can be separated from the peritoneal sac by gauze dissection and invaginated into the abdomen, a purse-string suture being inserted through the floor of the inguinal canal to prevent If, however, the peritoneal sac covers a considerable portion of the bladder it should not be stripped off, but excision should be performed around the bladder attachment on the inside, but going up as high as the abdominal ring on the outside where the sac is quite free. The bladder is then invaginated and kept in place by a purse-string suture Should, however, the floor of the inguinal canal prove to be too weak, and recurrence expected, a flap from the anterior sheath of the rectus can be turned outwards and sutured to the internal oblique. After the bladder herma has been dealt with a radical cure of the inguinal or femoral herma is performed - British Journal of Urology, vol ii, No 1, March, 1930, p 7)

The Bacteriology and Treatment of Poliomyelitis.

E C Rosenow notes that the isolation of a streptococcus having peculiar neurotropic and immunological properties, from the throat, spmal fluid and brain and spinal cord in poliomyelitis, its demonstration in the throat by the precipitave reaction, its microscopic demonstration in the lesions after death and in the spinal fluid during life, as well as its probable relation to the globoid bodies cultivated by Flexner and Noguchi, and the results from the use of antiserum prepared with this streptococcus in the treatment of poliomyelitis, have been already recorded in a series of published reports Dr Rosenow has again cultivated this streptococcus from the throat, brain and spinal cord and for the first time, in pure culture, from the spinal fluid, in cases of typical poliomyelitis occurring in The results from the use of poliomyelitis another epidemic outbreak anti-streptococous serum were observed in the treatment of a series of patients with epidemic poliomyelitis and of experimental poliomyelitis in monkeys, and in the immunization of monkeys with the streptococcus against poliomyelitic virus The curative action of the serum, states the author, seemed unmistakable and was manifested in

several ways, annoying symptoms such as pain, headache, fever and high pulse rate, often disappeared promptly, paralysis seemed to be prevented if treatment was given in the pre-paralytic stage before there was marked involvement of the spinal cord, progressive paralysis was apparently arrested in many cases, and the death-rate and incidence of residual paralysis were markedly lowered. Further trial of poliomyelitis antistreptococcus serum, especially in the concentrated form, in which severe reactions are largely eliminated, is indicated—(Journal of the American Medical Association, vol. 94, No. 11, March 15, 1930, p. 777.)

Tuberculosis of the Larynx. Its Incidence and Treatment.

E Wessely contributes an interesting survey of the incidence of laryngeal tuberculosis at the Vienna Oto-Laryngological Clinic concludes that laryngeal tuberculosis is a much commoner complication of pulmonary tuberculosis than is usually supposed experience the disease extends to the larynx in about 50 per cent of cases of phthisis The difference between the sexes as regards incidence was striking, the proportion of men to women affected was as 2 4 1 observed on a series of 715 patients. The commonest The treatment of age of onset was during the third decade laryngeal tuberculosis is both general and local General treatment is directed to improvement of the lung condition school is opposed to the use of tuberculin in any form in these cases otherwise general treatment conforms to the usual modern methods of treatment of phthisis Symptomatic local treatment is mainly for the relief of pain and of dyspnæa Pain is relieved in early cases by application of 10 per cent oil of menthol, in severe cases by orthoform, and as a last resource by painting with cocaine. These applications should be made before meals in order to obtain comfort in swallowing Dr Wessely recommends local application of artificial sunlight as the most hopeful curative measure. There is a prospect of cure of the local condition, or of great amelioration, in An early effect of this treatment about one third of cases treated is disappearance of the troublesome dysphagia — (Wiener Medizinische Wochenschrift, February 22, 1930, p 301)

The Treatment of Sterility

M Douay recommends the treatment of sterility by injection of lipiodol into the Fallopian tubes followed by insufflation of compressed air when the tube is permeable. The injection of lipiodol or the insufflation of air may each be carried out alone, with frequently good results, and on the whole the author prefers the injection of lipiodol as being a safer procedure. For the successful injection of lipiodol it is necessary to be very gentle and unhurried, taking half-an-hour over the injection and examination by X-rays. In cases in which the Fallopian tubes are made permeable, following these methods, pregnancy has resulted in 28 to 32 per cent. of cases—(La Gynécologie, vol. 28, November, 1929, p. 688.)

PRACTICAL NOTES

The Treatment of Gastric Ulcer

W C Seelye and D S Adams give a summary of 105 cases of gastro-enterostomy operated upon at the Memorial Hospital, Worcester, Mass, US.A, between 1919 and 1928. They come to the conclusion that cases of simple gastric and duodenal ulcer should first be treated by medical methods, and only where adequate medical treatment fails or where obstruction, perforation or persistent hamorrhage exists, the treatment should be surgical. Of the 105 cases in this series 71 were males and 34 females, 7 patients died in hospital and 9 died at home after discharge, while 11 patients were untraced after discharge. Of the 78 living patients who were traced 68 had their symptoms relieved by operation, and in 10 cases the symptoms were reported as unrelieved, of these 10 cases I is definitely a failure, but the other 9 are all working and admit that when they are careful with their diets little trouble is noted—(New England Journal of Medicine, vol. 202, No. 10, March 6, 1930, p. 469)

The Serum Treatment of Post-vaccinal Encephalitis

J Hekman describes the method he has adopted for the treatment of post-vaccinal encephalitis. He injects serum intravenously from a person who has been vaccinated at the same time as the patient, but who has not developed nervous complications. In the series reported the serum was obtained from one or other parent of the patients. 10 c.c.m. of serum is injected as soon as possible after the diagnosis has been made and this amount is repeated once or twice daily until the temperature falls nearly to normal. In three cases with a high temperature and typical signs of encephalitis the injections were successful and the patients recovered with no residual symptoms, in a fourth case the child died in hyperpyrexia—(Medizinische Welt, February 22, 1930, p. 247)

The Treatment of Rickets with Irradiated Ergosterol

V Jourdam and H Simmonet bring forward more evidence regarding the value of irradiated ergosterol in the treatment of nickets. Under the effects of this treatment the weight of the child rapidly increases, the epiphyseal enlargements diminish, the costo-chondral "rosary" becomes smaller and other deformities of nickets improve, provided they are not too advanced. The earlier treatment is instituted the better are the results. Periodic X-ray examination of the skeleton during the course of treatment is particularly interesting as showing the improvements that ensue—(Journal des praticiens, vol. 44, No. 12, March 22, 1930, p. 187)

Narcotic Drug Addiction in the Female

M O Magid points out that in spite of all that has been written regarding addiction to narcotic drugs, the consideration of this

problem still remains limited to a comparatively small fraction of the medical profession The average practitioner hardly realizes that he is sometimes unconsciously a factor in starting the patient In an analysis of 147 cases of drug on the road to addiction addiction at the Philadelphia General Hospital, McIver and Price conclude that the largest angle factor in producing morphinism has been professional medications. Dr Magid insists that the average addict is as normal as the average non-addict, once she is placed in the nontoxic state and in proper environment clear that the menstrual function is disturbed and pregnancy interfered with, in cases of drug addiction in women "cure" is a misnomer, the remedies used are only means of over-coming the withdrawal phenomena. A cure can be effected by proper management of the addict, after the withdrawal stage has been overcome - (Medical Journal and Record, New York, vol exxix, No 6, March 20, 1930, p 306)

Etrology and Treatment of Alopecia

F Moses discusses the various etiological factors in the causation One type, considered to be of nervous origin, is often associated with sympatheticotonia, and responds well to stimulating local applications of tincture of iodine or chrysarobin form, seen in the convalescent stage of acute infections is due to metabolic disorder and is amenable to general tonic measures, and particularly to the internal administration of arsenic combined with short local exposures to artificial sunlight But the commonest form of alopecia is the seborrheic, associated with a seborrheic condition of the skin This condition is due to dysfunction of the endocrine system, but which endocrine is at fault is unknown. The condition shows itself in an abnormal secretion of the sebaceous glands of the hair follicles which is deficient in cholesterin. Administration of cholesterm acts almost as a specific remedy, if taken regularly prognosis in such cases is good. Dr. Moses uses an alcoholic preparation of cholesterm (trilysin) which is readily absorbed—(Therapie der Gegenwart, February, 1930, p 69)

The Treatment of Anæmia in Pulmonary Tuberculosis

C Garm, J Boucomont and M Rougier have treated a series of 16 patients suffering from pulmonary tuberculosis with liver extract. The patients had all been in a tuberculosis sanatorium for one month, so that they had become accustomed to the dietary and the general conditions of life there. After treatment with liver extract for two weeks it was found that there was in every case a considerable increase in the red blood corpuscles and in the hæmoglobin content, but there were no changes in the leucocytes. The weight and the condition of the lungs were not affected either favourably or unfavourably—(Paris médical, January 4, 1930, p. 31)

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PRACTICAL NOTES

Hæmoplysis in Typhoid Fever

N Gavazzi describes hemoptysis occurring in typhoid fever, and is quite certain that in a case personally observed the hemorrhage did not come from any other intercurrent affection of the lungs. In his opinion the hemoptysis arises from a local lesion, an ulceration of the bronchial mucosa analogous to the ulcerations which are commonly observed in typhoid fever in the intestine and also sometimes in the larynx—(Rinascenza Medica, vol. vii, No. 7, April, 1930, p. 167)

The Etiology and Treatment of Chronic Arthritis

A A. Fletcher emphasizes the complexity of the etiology of chronic arthritis Malnutrition is believed to be one of the important contributory or predisposing causes of this disease The disturbances of tone and motility of the colon observed in many patients with chronic arthritis are manifestations of malnutrition disturbances antedate the development of the arthritis the influence of certain dietetic measures, notably the liberal administration of vitamin-B and the restriction of carbohydrate, the radiological appearance of the colon tends to become normal These dietetic measures exert a favourable influence on the course of the arthritis in those patients showing colonic disturbances In cases of chronic arthritis, where the disease is secondary to a focus of infection, it is probable that malnutration at times creates the state favourable to the development of this infectious process In other cases the colon itself is probably the source of the infectious or toxic agent causing the disease —(Canadian Medical Association Journal, Vol xx11, No 3, March, 1930, p 320)

Acquired Ureteral Stricture

K Frater points out that the commonest conditions in which ureteral stricture occur are renal tuberculosis and pyelonephritis The recognition of the stricture without recognizing the important etiological factor of renal tuberculosis is a not uncommon error, and one pregnant with grave possibilities to the patient that stricture occurs in pyelonephritis is well recognized, many regard it as the primary factor, and the pyelonephritis as secondary The treatment of chronic pyelonephritis would be greatly simplified if this were the case However, dilatation in pyelonephritic cases has failed to give the relief that should follow if this were the case Where genuine stricture exists in pyelonephritis considerable relief follows dilatation. Many authorities look upon stricture of the ureter as the important etiological factor in stone in the kidney This, too, has not been borne out by investigation The importance of this is obvious in the after-treatment of stone The wrong diagnosis of stricture, followed by numerous dilatations of the ureter, leads to much unnecessary treatment and suffering, the overlooking of real cause of symptoms, and to considerable loss to the unfortunate patient -(Journal of the Medical Association of South Africa, Vol 1v, No 5, March 8, 1930, p 133)

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Preparations, Inventions, Etc.

The Doctor's Mission Reflections, Reminiscences and Recelations of a Medical Man By Dr Erwin Liek, Surgeon of Danzig Translated and introduced by J Ellis Barker London John Murray, 1930 Crown 8vo, pp xxxix and 276 Price 6s

This book has been translated from the seventh German edition by Mr J Ellis Barker, the author of books on cancer, chromo constipation, and other topics, who in a somewhat egotistic introduction records a number of cases much benefited, if not cured, by his dietetic and other directions. Mr Barker is a layman and writes with ability, but not always with strict accuracy, for example, when bromides are stated to fill the lunatic asylums with epileptics made insane by medicinal means. He entirely agrees as regards the frailties of the medical profession with Dr Liek, of whose book 30,000 copies have been sold in three years and has obviously had a very great popular success. Its object is described as an attempt to ascertain if, and how far, the medical profession has carried out its task The weakness of insurance (panel) practice is shown up, and it is suggested that Germany lost the Great War because the moral character of the nation had been undermined by the social insurance system The general tone of the book recalls that of Mr. Bernard Shaw's preface to "The Doctor's Dilemma", it will naturally raise much opposition from members of the medical profession, and the author no doubt has emphasized the weak points and failures of medical practice, but there is much to be said for his contention that hostile criticism has its value

Anæsthesia and Anæsthetics By F S Roop, MB, BS, and H N Webber, MA, BCH, Anæsthetists to University College Hospital Pp 292, 4 black-and-white plates and 56 illustrations in the text London Cassell & Co, Ltd 1930 Price 14s net

This book is exceedingly interesting as an exposition of the methods of anæsthesia in vogue at University College Hospital, a hospital which has become notable in the realm of anæsthetics as the centre in London of a school of thought biassed in favour of simplicity of both apparatus and anæsthetic agents. The tendency in recent years has been generally towards the use of apparatus of increasing complexity for administering anæsthetics, designed chiefly to guarantee for long periods the maintenance of a steady and almost automatic supply of the anæsthetic agent. Such apparatus has undoubtedly a valuable place, but it is certainly bad practice to employ complicated methods and apparatus for a technically simple case. There should be nothing in the apparatus

died last year, and the first—a new—chapter on the evolution of pathology goes into a subject new to most readers in this country, namely the history of pathology in early Indian times, here in Arabian with a translation the reader is presented with an analysis of the contents of the Nidana (pathology) written by Madhaba in the seventh century AD. The numerous subjects undertaken by this work are fairly well covered, as is natural and right, special attention is paid to the diseases prevalent in India, some of the illustrations, especially those on skin diseases and large tumours, are very graphic and remarkable. This generously illustrated textbook will no doubt be much appreciated by Indian students

Bibliography with Synopsis of the Original Papers of the Writings of Sir James Mackenzie, M.D., F.R.C.P., LL.D., F.R.S. Edited by W. B. R. Monteith London Humphrey Milford, Oxford University Press, 1930 Demy 8vo Pp. 97 Price 4s

THERE can be no doubt that it is often useful to have a complete guide to the writings of a leader in medicine such as the late Sir James Mackenzie This has been very successfully done by Mr Montesth, who tells the reader that in the first instance this concise abstract of Mackenzie's numerous papers was made for the members of the staff of the St Andrew's Institute for Clinical Research, which he founded and now appropriately bears his name The articles summarized appeared in the period between the first half of 1883 and the second half of 1924, and have been divided into the groups according as they deal with medical education and research, cardiology which is naturally the largest, symptomatology, and miscellaneous The editor is to be congratulated on the way in which he has carried out a rather difficult task of une acid An N group should be replaced by an NH group With reference to diabetic coma on p 227, this is stated to be due principally to the acidic properties as opposed to their ketonic (enolic) properties To the student-indeed to anyone-this statement as it stands presents difficulties, for hydroxybutyric acid in the blood causes few symptoms, while the enolic form of aceto-acetic acid is highly poisonous in minute amounts, stimulating the respiratory centre and thus causing the symptoms of air-hunger and coma

The Queen Charlotte's Practice of Obstetrics By J BRIGHT
BANISTER, MD, F.R.CS, ALECK W BOURNE, MB, FRCS,
TREVOR B DAVIES, M.D, FRCS, L CARNAG RIVETT, MC,
FRCS, L G PHILLIPS, M.S, FRCS, C S LANE-ROBERTS,
MS, FRCS Second edition, 1929 Pp 635 4 coloured
plates and 274 illustrations London J & A Churchill
Price 188

This is essentially a practical book, as might be expected of the production of the active staff of such a hospital as Queen Charlotte's There are not many apparent changes in the text (though "hyperdermic" on p 160 might have been corrected)

Preparations, Inventions, Etc.

ERBOLIN

(London Messrs Stafford, Allen & Sons, Ltd , Cowper Street, Finsbury, E C.2)

The difficulties of effective ergot administration are well known, it is true that the active principle (ergotoxine) can be injected under the skin, or indeed can be given by the mouth, but there is no stable liquid extract. Under the name of Erbolin Messrs Stafford, Allen & Sons have introduced a preparation of powdered defatted ergot, which biological tests conducted under the auspices of the Pharmaceutical Society of Great Britain have shown to have an effective action on the uterus. Each capsule of Erbolin, which is intended to be given by the mouth, contains the equivalent of 0.5 mgm ergotoxine phosphate

NORMACOL

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Normacol is an intestinal evacuant, consisting essentially of dried mucilage in granule form, which has already won wide favour from the medical profession. We have just received a sample, however, which, on examination, proves to have a very much improved flavour, which cannot but make the product more acceptable to fastidious palates. The manufacturers inform us that no alteration has been made in the character of the Normacol itself, and in spite of the increased cost of production brought about by the latest improvement, the selling prices remain unchanged

DUO-FOCALS

(London Messrs Curry & Paxton, 195, Great Portland Street, W)

Dr Herbert D Everington (Sanderstead) has designed a new form of bi-focal glasses, to which he has given the name of "duo-focals" They consist of an ordinary pair of spectacles, having distance lenses mounted in the usual manner Hinged to the outer and posterior part of the fronts are two plus-lenses, which can be swung over the distance lenses, thereby adding the convex lens required to render the combination the correct reading-glasses. The plus-lenses when not in use are folded back and lie along the inside of the arms of the spectacles. These glasses appear to us to offer several advantages over the ordinary bi-focal glasses.

died last year, and the first—a new—chapter on the evolution of pathology goes into a subject new to most readers in this country, namely the history of pathology in early Indian times, here in Arabian with a translation the reader is presented with an analysis of the contents of the Nidana (pathology) written by Madhaba in the seventh century A.D. The numerous subjects undertaken by this work are fairly well covered, as is natural and right, special attention is read to the administration of anæsthetics than this book, on which the authors are to be congratulated

Souvenir of the Henry Hill Hickman Centenary Exhibition, 1830-1930, at the Wellcome Historical Medical Museum London The Wellcome Foundation, Ltd 1930 (10 in by 7 in Pp 85, 13 illustrations and 11 MSS reproductions)

This is a beautifully got-up and generously illustrated footnote to the history of anæsthetics, and provides all the available information of the short life and struggles of Henry Hill Hickman (1800–30), a country practitioner, like Jenner, imbued with the genuine scientific spirit of research. Until 1913, when Dr. H. S. Wellcome was organizing his Historical Medical Exhibition for the XVIIth International Medical Congress in London, Hickman had received little notice. The documents relevant to his work are now for the first time published in full and in a most attractive form.

Birth Control on Trial By Lella Secor Florence With a foreword by Sir Humphry Rolleston, Bart, K.C.B., M.D., F.R.C.P., and an introductory note by F. H. A. Marshall, Sc.D., F.R.S. Pp. 160 London George Allen & Unwin, Ltd. Price 5s

This is the first sensible book that we have read about birth control. It describes, without bias or expurgation, the facts discovered by a house-to-house investigation of the after-history of some 250 patients (mostly working women) at a birth control clinic. Mrs. L. S. Florence sets forth their views with painstaking accuracy, often quoting conversations and letters verbatim, and the result is a frank admission of the difficulties and limitations of the technique of birth control, or the various forms of contraceptive methods. The transparent honesty of this report and its entire lack of emotionalism make it extremely valuable, and it may be calculated to stimulate the medical profession to study the subject seriously and undertake much needed and hitherto neglected research.



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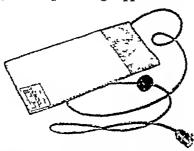
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in any shape or size. It can be bent, folded or doubled up with perfect safety, while the current is on, and costs but a farthing an hour to run. In addition to the warmth provided by the electric current the pad is mildly radioactive, the National Physical Laboratory report states that the radioactivity of the pad is equal to that of 0.01 milligrams of radium. The makers state that they are prepared to send one of these pads on loan, without any obligation, to any registered medical practitioner on mentioning The Practitioner

LYDIN

(Watford, Herts Messrs Endocrines, Ltd)

Lydin is the name given to a new testicular extract, the active constituent of which is a concentrate (1 62) from the interstitial cells of Leydig, which, as standardized by Koch, is stated to be capable of restoring secondary sex development in castrated birds and animals. This is reinforced by the addition of the anti-sterility vitamin E (20 per cent.) Lydin is put up in 5 grain capsules and is intended to be given by the mouth. As is well known, the efficacy of such extracts when given by the mouth has not hitherto been definitely established, but in view of the success of the animal experiments reported, it will be interesting to learn whether wide clinical trial of Lydin in this country will bear out that this difficulty has now been overcome

MEZZOTINT PORTRAIT OF SIR JAMES MACKENZIE

(London Masterpiece Engravings, Ltd., Dunedin House, Basinghall Avenue, EC2)

Mr Herbert Sedcole has engraved a mezzotint portrait of the late Sir James Mackenzie from a drawing by Sir James's daughter Dorothy The portrait is a striking one, and should be treasured not only by Mackenzie's disciples, friends and acquaintances, but also by those who, although they never saw him in the flesh, honour his work and his memory. The price of signed artist proofs in monochrome is two guineas

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See Quarterly Journal of Pharmacy Vol. II, No. 4 Ibid Vol. II, No. 3

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APPOINTMENTS.

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- AHERN, J M., MB, BChRUI, appointed Medical Officer at Parkhurst, Isle of Wight
- AITKEN, CHARLES J HILL, M D, appointed Medical Officer to Kilohurst Child Welfare Centre and School Clinic.
- BADENOCH, A. M.B., Ch.B.Ed., appointed Certifying Factory Surgeon for the East Linton District, East Lothian
- BURR, W 5, MB., Ch.B., FRC5 Ed , D O M S.R C P S. Lond , appointed Surgeon to the Plymouth Eye Infirmary
- CAMPBELL, J M H., M Doxf, F R C.P., appointed Physician to Out patients, National Hospital for Diseases of the Heart, Westmoreland Street, W
- CLARKE, JOSEPHINE, M.B., B.Ch. N.U.I., appointed Medical Officer for Arranmore Dispensary District
- COX, GLADYS M, MB., BS Lond, appointed Nedical Officer for Clinics at Armada-street Centre Greenwich
- CRAWFORD, MABEL, MD, BCh Dub., appointed Hon. Asst Surg, Liverpool Maternity Hospital.
- ELLIS, ROBERT., M.C., M.D. Lond, appointed Medical Referee under the Workmen's Compensation Act, 1925 for the Districts of Chard Langport Taunton Wellington and Williton County Courts (Circuit No. 57), vice L. H. C. Birkbeck V.B. B.S. Oxon resigned
- EMSLIE, ETHEL R, MB., Ch.B., DPH Aberd., appointed Fourth Resident Assistant Medical Officer Booth Hall Infirmary for Children, Vanchester, E
- FARRELL, MARY, MB, ChB,
 NUI, appointed Medical Officer for
 Longford
- FLEW, J. D., B.S.Lond, M.R.C.S., L.R.C.P., appointed Assistant Resident Medical Officer Queen Charlotte's Materiaty Hospital N.W. i
- FRANKS, C., M D Brux., L S.A., D P H, appointed Deputy Medical Officer of Health for Durham County
- HANNA, MARGARET ROBB, MB, BCh., BAO, DP H.Belf., appointed Assistant Medical Officer of Health for Vaternits and Child Welfare to the Counts Borough of Walsall
- HUGHES, T. I., M.R.C.S., L.R.C.P appointed Senior Resident Medical Officer Queen Charlotte's Maternity Hospital

- IREDELL, C. E, M D.Lond., M R C.P Lond., appointed Physician in Charge of the Electro-therapeutic Department, Freemasons Hospital and Nursing Home Fulham Road, S W
- KIEP, W H., MB., Ch B., appointed Specialist Medical Referee under the Workmen a Compensation Act 1925, in take ophthalmic cases in the districts of the Bradford, heighley, Shipton and Settle, Halifax, and Huddersfield County Courts
- KREMER, M, L.R.C.P Lond, M.R.C.S., appointed House Physician, Middlesex Hospital.
- LOBBAN, J W., MB., ChB Aberd, DPH, appointed Assistant Medical Officer of Health and Assistant School Medical Officer for Chester
- LOGAN, F C., MB, Ch B Glass, appointed Vedical Superntendent of the Gloucester County and City Mental Hospitals
- McKEGGIE, J. W., M. B., Ch. B. Aberd, D. P. H., appointed Medical Officer of Health West Hartkepool.
- MORLEY, J. M.B., Ch.M. Manch., F.R.C.S. Eng., appointed Lecturer in Systematic Surgery in the University of Liverpool
- M'POLIN, MD, NUI., DPH, appointed Medical Officer for Limerick County
- NICHOLSON-LAILEY, J R, MB, ChB, F.R.C.B Eng, appointed Honorary Surgeon to the Taunton and Somerset Hospital
- PARSONS. FLORENCE, Miss MRCS, LRCP, appointed Resident Anaesthetist, Queen Charlotte's Maternity Hospital, NW 1
- RIDDELL, JAMES W G H, MC, MD., F R C.S.Ed, appointed lionerary Assistant Sungeon with charge of the Obstetrical and Gynaccological Department, South Devon and East Cornwall Hospital Plymouth, Devon
- SEWELL, D LINDLEY, MB, BS Lond., appointed Honorary Surgeon Laryngologist to the Manchester Radium Institute
- SIMPSON A 5, M B., B S., D P H., appointed Assistant Medical Officer of Health for Carlisle
- SIMPSON, G S., FRCS Eng., appended Professor of Surgery in the University of Sheffield
- STARKEY, WILLIAM, M B., B Ch., appointed Resident Medical Officer and Manager of Brvn y-Neuadd Mental Hospital Wales
- WRIGHT, ELSIE, Miss, MB, BS, appointed District Kesident Medical Otherr Queen Charlotte's Maternity Hospital



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Articles may be illustrated by black and white drawings or by photographs if by the latter, negatives should be sent with the prints whenever possible

Reprints of articles are charged at cost price and should be ordered proofs are returned to the Editor

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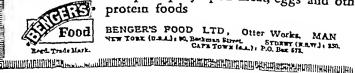
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